NATIONAL PUBLICATION FOR BUYING-USING-SELLING COMPUTER HARDWARE & SOFTWARE

VOL. 5 NO. 6
JUNE 1985

$2.25

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COMPUTER SHOPPER™

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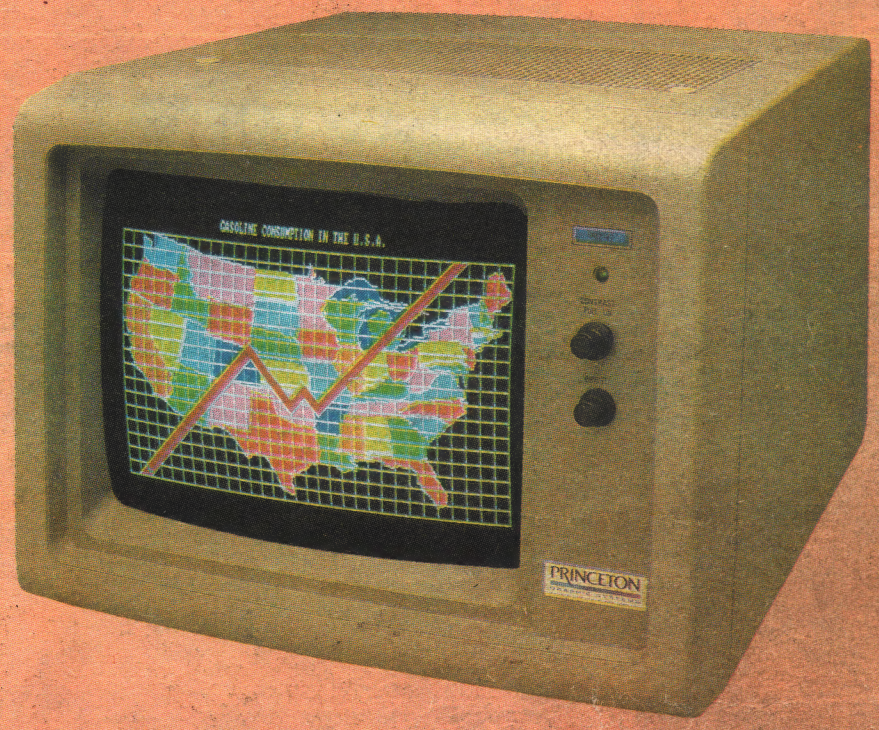

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Digital Research Computers on pg 199

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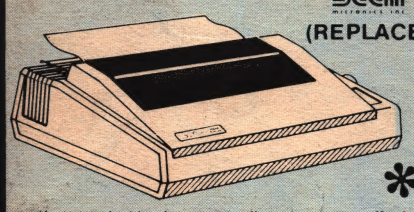
(REPLACES THE GEMINI 10X)



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If you are looking for a top quality printer at an affordable price, you've found both in the new Star SG-10. The SG-10 operates bi-directionally at 120 cps and includes many special features such as near letter quality printing, easy access format switches for a wide range of character modes and character sets, friction feed for single sheets and tractor feed for fanfold paper, and even hex dump. Another special feature is the IBM character sets available at the flip of a switch.

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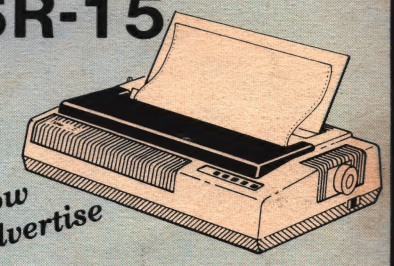

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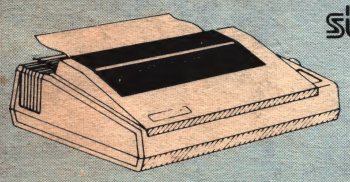
star micronics inc **SD-10**



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Are you someone who needs those spreadsheets printed yesterday? Then the Star SD-10 is for you. It provides fast bi-directional printing and software controlled switching from 80 to 132 column condensed. The technology of the New Star SD printers provides both a high 160 cps printing speed for draft mode plus a NLQ (near letter quality) mode. Innovative features include: bi-directional logic seeking,friction feed for single sheets, and tractor feed for fanfold paper. A wide range of character modes (pica, elite, condensed, bold, underline, double strike, super/sub scripts and more).

Plus a wide variety of character set choices (ASCII, international, Star standard special, IBM special, block graphic, downloadable and italics). You get a generous 2k print buffer that will hold 8 full pages of information . . . a great convenience and time saver. The Star SD-10 is in a class by itself when it comes to value. Star's ultra-modern production techniques assure exceptional cost efficiency without any compromise in quality. Your SD-10 is an excellent investment.

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Now you can get the time saving features of the Star SD-10 printer plus a wide 15" carriage with the SD-15. Enjoy fast 160 cps print speed plus the generous 8 page print buffer and NLQ (near letter quality) print mode. Capture the spirit of the Star SD-15. Call Today!

Be confident your correspondence becomes you with . . .

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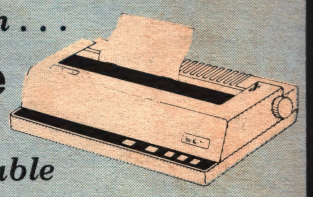
Daisywheel



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For crisp executive quality correspondence you need the PowerType. The PowerType gives you bi-directional printing at a brisk 18 CPS. Standard Epson and Qume codes make it adaptable to virtually all personal and business computers! With the ability to produce letter quality data processing and graphics it is versatile enough to fill all your printing needs.

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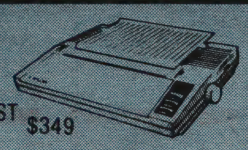


The new Epson Spectrum LX-80 is perfect for the vast majority of your personal and professional printing needs, such as reports, term papers, recipe files or mailing lists.

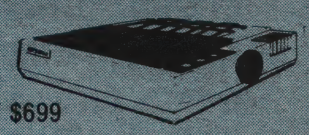
It's easy to set up and operate. And, with Epson's convenient SelecType feature, you can choose from a wide range of typestyles and graphics. With convenient Dual Mode operation, the LX-80 lets you zip through drafts at high speed, or produce finished copies with a high-quality, typewriter-style appearance. And it accepts a complete line of options for easy, future expansion

Because the LX-80 is made by Epson—the standard of the industry— it's compatible with virtually every computer system made. It inherits a reputation for dependability and durability that's unsurpassed by any other brand. And it offers a full one year warranty—the best in the business.

The new Spectrum LX-80 offers a combination of performance and value at a price that's second to none.

Get the most advanced personal printer you can buy with. . .

NEW ONLY **$389** **EPSON FX-80+** LIST $699



The FX-80+ is one of the most advanced personal printers you can buy. Offering you a print speed of 160 CPS, the FX-80+ also has a special half-speed quiet mode that keeps noise to a minimum. It contains an integral RAM that will allow you to create your own set of up to 256 characters or symbols, and then add them to the FX-80+'s already vast array of 128 different typsetyles.

Are there times you need just single sheet paper? No problem with the FX-80+ which gives you both pin and friction feed. And with the 2K buffer you can use your computer while your printer continues to print.

Needing graphics to get your point across? With the Epson FX-80+ you can do precisely that. With everything from graphics at 60 DPI (dots per inch) to 20 DPI, the FX-80+ gives you professional looking charts, graphs, and illustrations.

For versatility to meet your ever-increasing printing needs – the FX-80+ is for you!

Print Memos to spreadsheets with Epson quality with the. . .

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Offering a steady 100 CPS printing, the RX-100 gives you a fifteen inch wide carriage for spreadsheets and ledgers. With both friction paper feed and removeable tractor feed, you can print on forms from four to fifteen inches wide taking care of all your printing needs.

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A printer that's all business. . .

EPSON FX-100+

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Need those spreadsheets and ledgers printed yesterday? No more waiting with the FX-100+ giving you a capacity of 136 column printing and a print speed of 160 CPS.

With the same graphics features, 2K buffer, and paper handling capabilities as the Epson FX-80+, the FX-100+ will give you the 136 column printing at a modest cost. Handle your business reports as only a business printer should with the EPSON FX-100+

NEW *Find yourself having to give up print speed to get a good, crisp, near letter quality? No more with. . .*

LIST $1395

EPSON LQ-1500 **$CALL & SAVE$**

Now you can get speed and top print quality with the EPSON LQ-1500. At a lightning speed of 200 CPS, you can get those reports and memos done in a snap. No more waiting for your correspondence – the LQ-1500 offers a near letter quality mode at a brisk 67 CPS to get those letters done today.

Need those financial reports tomorrow? Providing you with a 15.5 inch carriage, the LQ-1500 is perfect to handle your spreadsheet needs.

Want to make sure those reports are understood? Why not try emphasizing your points with graphs and charts! The LQ-1500 can deliver charts and graphs beautifully!

Make your mark in business with style – the style of the LQ-1500

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FX-100+ (160 cps, 136 Col, 2k Buffer)	999	589
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  - And others!
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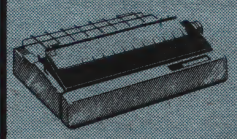

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New High Resolution Video Monitors For Graphics and Text

by Rich Fields

Early personal computers used TVs for video display, or so called monitors that were really TV sets with the RF front-ends removed. There were some surplus broadcast quality monitors on the market but they could only be adapted by hardware hackers with some skill in video.

Our own Guru, Don Lancaster was one of the leaders in teaching computer hobbyists to use video through his video handbooks and many hobbyists learned how to modify TV sets through his instruction.

The largest source of good quality video monitors came from the closed circuit TV industry which created a market for small, higher quality, video monitors that was filled by both American and Japanese manufacturers.

Computer Graphics in color became a reality for the personal computer with the development of the Apple II, Atari Computers, Commodore VIC-20, C-64, TI 99/4A and other computers operating with color boards. For all of these, TV's, converted TVs or low resolution Composite Video Monitors were adequate to reproduce the graphic miages that could be created with the available software. True, both Atari and Apple II were capable of high resolution graphics, but the amount of memory they had limited the images that could be reproduced.

The Apple III was the first personal computer that had the built-in ability to generate and use RGB color and high resolution graphics. Here again the available software for color graphics was very limited and the few RGB monitors available cost just under $1000, a very high cost for the little graphic software available. Apple wisely provided a composite video output for the Apple III as well as RGB.

With the advent of the IBM PC and other MSDOS computers, users had all the elements for color and monochrome graphics in one machine. The PC has enough memory to allow for the creation of high resolution images, it has the disk storage and the color graphics cards as well as meaningful software to make color graphics part of its normal operating mode. Business graphics, computer assisted design and video art software is plentiful and effective to say nothing of games and simulation software. Under these conditions the demand for higher resolution, color video reproduction has led to the introduction of many new video monitors at reasonable prices.

The personal computer owner is now offered a large choice of video display monitors and it is the aim of this article to introduce some of the units on the market as well as an explanation of terms used to describe them.

Bandwidth and Resolution

These are the specifications most often thrown at the buyer to make an impression for the monitor under consideration. What do they mean and how important are they?

The video circuits in the computer send signals to the CRT that are used to generate the pattern of dots on the screen that forms the picture. The range of frequencies in that signal, called its bandwidth, is the rate at which the screen is drawn. The higher the bandwidth, the more dots the video unit has the potential of producing on the screen. More dots on the screen produce a better picture. As in color printing, you can print a picture with a few large dots and you will get a recognizable but poor quality picture. You can also print the same picture with a great many small dots and with little space between them. The result is a denser, clearer picture. In the case of a TV set, the bandwidth is normally 4.5 MHz (if everything is working perfectly). Actually you get about 3.8 MHz from the average set. A good video monitor can operate with a bandwidth up to 50MHz, but actually most "high resolution" monitors claim bandwidths between 12 MHz and 18 MHz. To relate bandwidth to video resolution, you can get about 80 horizontal lines of resolution for each megaHertz of bandwidth.

Having a video circuit with high bandwidth though is no guarantee of a high quality image on the screen. For a text display, quality must start with the ROM character generator in the video portion of the computer circuit. Next, quality depends on how many dots in a matrix are used to draw the characters. The least legible quantity has 35 dots in a 5x7 matrix producing a character with wide spaces between the dots. A good quality character has 63 dots in a 7x9 matrix. We depend on the fact that the dot can never be perfect to fill-in spaces between dots. The electron beam hitting the phosphor to form the dot also produces a slight glow we call a "smear" that nicely fills in the space between dots in a fairly dense matrix such as a 7x9 array. A 5x7 matrix is too wide to be filled in, so you can see the spaces between dots.

For graphics display, the ROM character generator is not used and the dots on the screen, directly addressed by the computer, are turned on in groups to form pictures. The video memory in the computer is directly related to the screen. If you store a "one" in a memory location, it will turn on a dot in the related position on the screen. Therefore the larger the video memory in the computer, the more complex pictures can be drawn on the screen. No matter how high the resolution of the monitor, it can't produce a better image than the one received from the computer.

Resolution can also depend upon the interlacing of the 525 horizontal raster lines in the picture. The 525 raster lines are broken into "frames," each composed of two scans of 262 ½ lines each. In order for the raster to operate properly the two frames must be perfectly interlaced so the lines of one fall exactly between the lines of the other. To accommodate our visual perception, thirty frames per second are drawn on the screen. Each frame has two fields. The use of 525 lines on the screen is a design aim not often achieved and many video units use a 260 non-interlaced raster. This works but produces a much lower resolution picture. If you use even a 5x7 character matrix it takes 7 scans to draw the character plus a few more scans for spaces between the lines resulting in about a 12 scan character space. If you only have a 260 line raster to start with, you can only have about 20 lines of characters on

Continued on page 10

Understanding Computer Displays

by L. Van Delray

This is the first part of a multi-part series explaining the basics of computer hardware. All explanations will be simplified and assume that the reader has an interest in computer hardware but only a little formal training in electronics.

We will begin with video displays. Future parts will discuss TV vs. monitor, composite vs. RGB color, and various specialized graphics techniques.

However, if there is any area in video, or computer hardware in general that you would like to see discussed, drop us a line here at the Computer Shopper. We will add the most commonly asked items to our list of future parts of this series.

Video displays as used in conventional monochrome and color TV, the bulk of arcade games, computer video terminals, and most other video monitors—all systems that use the cathode ray tube (CRT) as a display—use the "raster scan" approach. Before we discuss this CRT sweep, the reader should be familiar with the basic operation of a CRT.

The Cathode Ray Tube

All video displays—be they conventional black-and-white or color TV, a radar screen, an oscilloscope, or a computer video monitor—work because of the interaction that occurs when a fast-moving electron strikes a molecule having a particular atomic arrangement.

When this collision occurs, the energy in the speeding electron is absorbed by subatomic elements within the molecule it encounters, causing them to alter their electrical states. After a very brief period, the subatomic particles give up that energy and go back to the state they were in before the electron collision. However, during that brief interval when the energy exchange is taking place, the particles emit another form of energy—visible light.

The frequency (color) of the emitted light is basically a function of the chemical makeup of the molecule. Some molecules are chemically arranged to emit white light (ZnS:Ag), some green (ZnS-CdS:Ag), some red (Y202S:Eu), and some blue (ZnS:Ag), although other colors are available.

Note that the color white is typical of that seen in black-and-white (sometimes called monochrome) CRT's, while red, green, and blue emissions

Continued on page 20

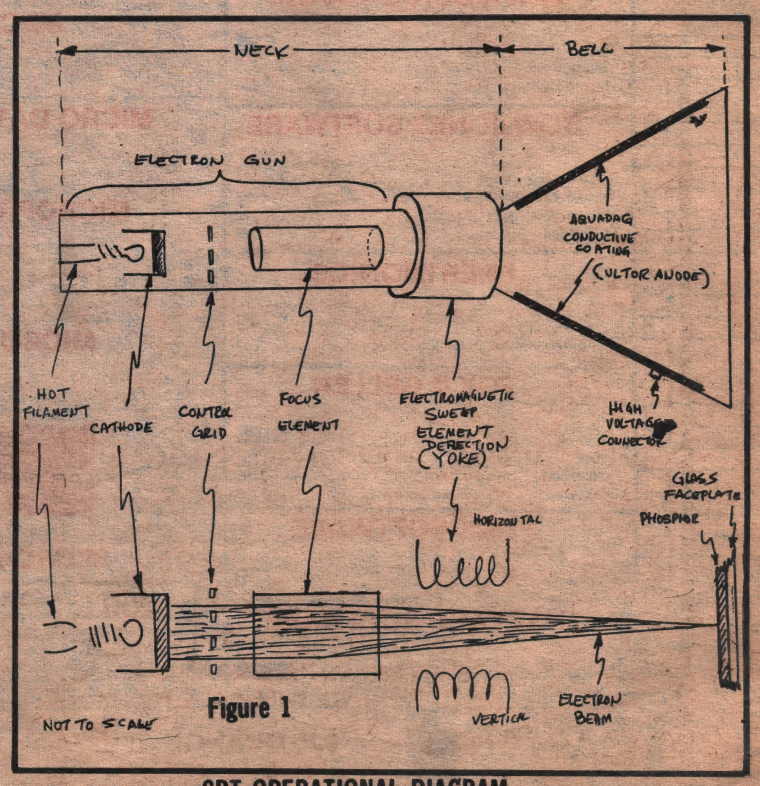

Figure 1

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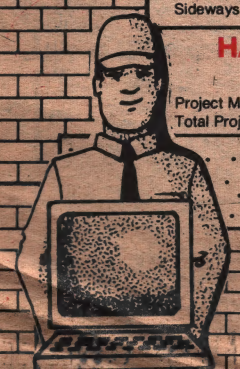

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New High Resolution
Continued from page 7

the screen. In order to compensate for lack of precision in the manufacture of TVs and inexpensive monitors, the designers introduced "overscan" (having more lines) at the center of the screen where most of the action takes place in TV. In monitors this produces distortion at the top and bottom of the screen.

Dot Size

Yet another component of resolution you may see specified is the size of the dots. If you have a line of dots that are too big, they will tend to overlap and prevent tones from being displayed. If the dots are too small there will be too much space between them and the result will be a fuzzy image. Today the tendency is to consider the width of each line as being divided into very small boxes, each one having a dot plus some white space around it. Each box is called a "picture element" or pixel for short. If the dot is in the center of the box with just enough white space around it you will get a better picture on the screen. The optimum size of dots for a CRT of 12" to 16" seems to be in the range from .30mm to .50mm. TV sets or inexpensive monitors may have a dot size about twice this diameter.

Each manufacturer seems to define resolution differently, some use dots per inch and lines per inch. Some use pixels and some even give you the total number of dots on the screen. This is all a selling ploy to make the product look good. When the specification does not give the resolution in pixels or dots horizontal and lines vertical, beware! Someone is hiding something from you. The mere phrase "high resolution" means nothing. Nobody makes "low resolution" monitors.

One more note, don't get caught up in a numbers game. Read the video specifications for your computer and only buy as good a monitor as you need. Otherwise you may be throwing away money.

Monochrome Monitors

Monochrome monitors are rated by their bandwidth and the resolution of the display. They are available in black and white, black and green, and black and amber. Some viewers find the green or amber monitors better to use. In some European countries, the black and amber has become the required standard.

As a rule monochrome monitors are much better for reproducing text characters than color monitors. If most of your work is word processing or programming and you sit in front of a monitor all day, by all means make it a monochrome. But you might want to consider a second monitor for color graphics. There are now some color monitors on the market that offer a "text mode" meaning when text mode is selected, the screen turns off all colors except green and black, simulating a monochrome monitor.

If your computer is of the type that requires a plug-in video adapter board (IBM PC and other MSDOS computers) and you have a color adapter board, you will get small improvement by using a monochrome monitor.

Color Monitors

There are two types of color monitors, Composite Video and RGB (Red, Green, Blue). Composite video refers to the type of video signal used by TV

The RGB type of color monitor has three separate video signals, each controlling a separate electron gun to generate electron beams for Red, Green and Blue colors. RGB color offers the possibility of much higher resolution and greater bandwidth, resulting in a greater selection of colors and sharper images.

There are actually two systems of RGB color in use, *analog* and *digital*. The analog type works, as described in this chapter, by delivering the signals directly to the electron guns. *Analog* signal is the video signal that controls the video gun. In the *digital* system the signal is derived from a microprocessor which receives information about the video in digital form and controls the video beam. The analog method can produce a much wider variation in color and brightness. The digital system is more restricted and the color range depends on the size of the memory associated with the microprocessor.

Good RGB monitors cost more than composite video monitors, but offer noticeable improvement in color reproduction and graphic capabilities.

Size Considerations

Bigger is not better. In fact just the opposite is true. The larger the CRT the greater is the distance between dots and the worse the image appears close up. Have you ever had the experience of trying to align a TV while standing close to it? You can't really see the picture until you step back from it. Don't buy a 14" or 16" CRT and sit within 18" of the tube. It will be impossible to adjust the controls for clear vision. Big CRTs are for big rooms. Nine, twelve or thirteen inch CRTs are large enough for a monitor seated on top of your computer.

Amdek Color IV RGB Color Monitor

Amdek Color IV is a 13" RGB color monitor using an analog signal input to produce an unlimited number of software designated colors. The screen display is 96 characters by 24 lines using a 5x7 matrix. For color graphics the Color IV has a resolution of 720x420 pixels. The Color IV lists for $995 and is intended for use with computer aided design applications. The text image is acceptable and the graphics images are exceptionally good.

Amdek Color 600 RGB Monitor

The Color 600, a high resolution 13" RGB color monitor with a built-in swivel stand, provides 80 character by 25 lines of text display. A special text switch on the front panel enables the user to change the text color from white on black to green on black for easier reading. For graphics the monitor resolves 640x240 pixels and has a switchable color matrix allowing the Color 600 to provide the full view of 16 IBM or Apple colors. The Color 600 also has a built-in audio amplifier with a speaker. A tilt stand is an option. This is a good, all-around RGB color monitor and an excellent value. The Color 600 comes with a two year warranty.

Amdek Model 700 & 710 RGB Color Monitors

The Amdek Color 700 and 710 monitors are ultra-high resolution RGB monitors that interface with computers such as the IBM PC and Apple II with the RGB card. The 700 series has a resolution of 720x240 pixels allowing the monitors to provide vivid 16 color displays for graphics applications. It can display up to 96 columns by 25 lines of text. Characters are made of .31mm dots which give a sharp appearance to the text display. A text switch on the front panel changes the text color from white to green for easy viewing. Even if you pay list price, this monitor is a good value and you will like the display. It is one of the few color monitors with good text reproduction. Take a look at Lotus 1,2,3 on this monitor.

For information: Amdek Corp., 2201 Lively Blvd., Elk Grove Village, IL 60007. 312-595-6890.

IBM Color Display

IBM released an RGB Color Display under its one name. The Color Monitor is a 12½" RGB monitor displaying 80 characters by 25 lines with an 8x8 matrix, a coarser one than used on the IBM monochrome Monitor. The characters show it. You do get graphics and color as a trade off however. The monitor displays up to 16 colors and the graphics resolution is 640x200 pixels. The monitor will also do such text functions as underlining, inverse characters and blinking characters. This is a good color monitor capable of handling all the various functions of the IBM Color Adapter board. (It must be mentioned there are high resolution graphics boards on the market for the IBM PC that will produce graphcis requiring a greater resolution than the IBM Color Display can supply.)

NEC Model 1215M Composite Color Monitor

The Model 1215M, a 12" composite color monitor is capable of displaying 80 characters by 25 lines of text and color graphics. A medium resolution composite video monitor for such computers as Apple II and home type computers such as Commodore 64 and the NEC P8001, the Model 1215M has a bandwidth of 8 MHz and produces excellent color graphics.

NEC 1410P2A RGB Color Monitor

The 1410P2A, a 14" RGB monitor, is suitable for use with IBM PC-type computers using high resolution graphics boards. It is an ultra high resolution monitor displaying 80 characters by 25 lines or color graphics with a resolution of 800 by 400 pixels.

For information: NEC Home Electronics (USA), Inc., Personal Computer Div., 1401 Estes Ave., Elk Grove Village, IL 60007. (312) 228-5900.

Panasonic DT-1300D Color Monitor

The DT-1300D, an unusual monitor, combines both RGB and composite input and operation. An 80x24 character monitor, it has 450x240 pixels for RGB mode or 300x300 pixels for composite mode.

For information: Panasonic Industrial Co., One Panasonic Way, Secaucus, NJ 07094. (800) 222-0584.

Princeton Graphic Systems

Princeton Graphics Systems was the principal beneficiary of the lag in the introduction of the IBM Color Display. Even IBM used Princeton monitors with the PC computers! Princeton has kept its lead in spite of the introduction of the IBM unit and many other quality video displays.

PGS HX-12 RGB Video Monitor

The HX-12, a 12" high resolution monitor with a bandwidth of 15 MHz, displays 80 characters by 25 lines with an 8x8 character matrix. It also produces color graphics with a resolution of 690x480 pixels. The monitor can display 16 bright colors on a non-glare, black matrix CRT. This tube reproduces characters from dots with a diameter of 31mm. The usual dot pitch (diameter) is 45mm. Because of this, the characters appear to be much sharper and the text displayed on the HX12 is easier to read than text on almost any other color tube.

The monitor is supplied with a cable that plugs directly into the IBM PC or any of the compatible computers. PGS makes a special RGB board for the Apple II so it can use the HX-12. The HX-12 lists for

Continued on page 184

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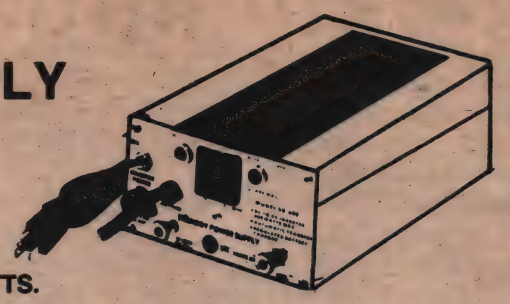

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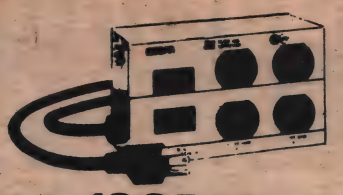

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Editorial

By Stan Veit

Where Are Personal Computers Going?

Personal computers are now ten years old and no one knows exactly where they are going. We know that they are in schools, in business, on the farm and in professional practices. They are also in many homes, both on the desk and in thousands of closets.

The closet population of computers represents millions of dollars spent for a product that most people had no earthly use for. People bought the machines because they were told that personal computers would somehow enrich their lives. They also bought them because they were told that their children would end up as ditch diggers if they were not computer literate and buying the computer was the least they could do to the save the kids from a life of hard labor. Who will ever forget the poor boy returning alone on the train, flunked-out of college because he couldn't use a Commodore 64. Woe to the parents who had sent him off without the mastery of BASIC and the 1541 Disk Drive.

What do you need a computer for in the home? I can think of hundreds of uses for a personal computer in the home, but I can't think of one single *Need*. I have several systems myself and I only use them in connection with my business, not in connection with my home life. I use every other appliance in the house in my daily living but I only turn on the PC when I have work to do. I am not the only one in this condition which is why the home computer is a flop and will continue to be a flop. There are still thousands of computer hobbyists who enjoy using computers and will always buy the latest and greatest, but that is different, a hobby is not a need.

What about that poor kid who must learn about computers to go to college? Well he, or she will learn in school and if interested will buy a personal computer to use at home as an aid to education or, as a hobby exactly as they buy a typewriter, microscope, or fancy sewing machine. That is far from a mass production, home appliance industry.

My opinion is that the American home of the future will have an entertainment center with audio, video and computer capabilities. There will be one or more of 120 channels which can be for interactive computer networking. The computer will be a keyboard unit and it will record data on the same laser disk drive used for audio, or video. The computer keyboard will plug into the television set and it will add about $200 to the total price of the total equipment.

The largest group of businesses yet to be computerized are small retail stores. Strangely these are just the type of businesses that need the help they can get from personal computers. The biggest problem in a small retail business is inventory control. It is very hard to keep track of what you bought, how long you have stocked it and what is your correct mark-up. How do you know when you should take a mark-down and get your money out? These are the questions a personal computer can answer. It can also keep the books, print the bills and balance the checkbook, all jobs that now fall on the owner of the small business.

At a recent show I saw a wonderful retail software package which could help every retailer who sold clothes or shoes. The problem was that it cost $15,000 including an IBM XT. Not a lot of money for what it was, but out of the reach of most small retailers. Where is the company who will put such a system on a $300 Commodore or Atari and sell the system for $1,000 including disk drives, printer, monitor and software? It can be done, and who ever does it will be the next Apple or IBM. You would think that NCR would be the likely party, after all they made their money selling cash registers to small retailers. But no, NCR is off selling Super Tower computers to big business. Strange, they have left the cash register business to the Japanese who are great at building hardware but not at software applications.

At the same software show (Softcom) there were loads of good software packages for various businesses. Autobody shops, construction companies, bankers and bakers, doctors and lawyers. The problem is who is going to sell these systems and can the businesses they are intended for afford them? A computer store is hardly the place to sell vertical applications because they don't know anything about the particular business the package is intended for. The mail order company knows even less. It will take someone with experience and self-interest to demo these programs and teach users how to cope with the computers and the programs. The problem is in the cost of this massive support. There is no margin built into the price of the software to pay for it. The potential customer is afraid to buy, because a mistake could prove to be a financial blow that might put his company out of business.

The way this industry has introduced computers and then abandoned them is hardly reassuring. Software is just as bad, for every Lotus 1-2-3 there are hundreds of Jack2s, programs introduced as the greatest thing since sliced bread and then poof, gone in a fortnight. The way to sell to the retail business person who needs a computer is to specialize in sales and support with arrangements for finance of the purchase, education, software support and third part maintenance of the hardware. The need is there now, the equipment will be on hand by the end of this year when powerful low cost computers will be on the market from Commodore, Atari and who else? The software can be easily produced . Who is going to put it all together?

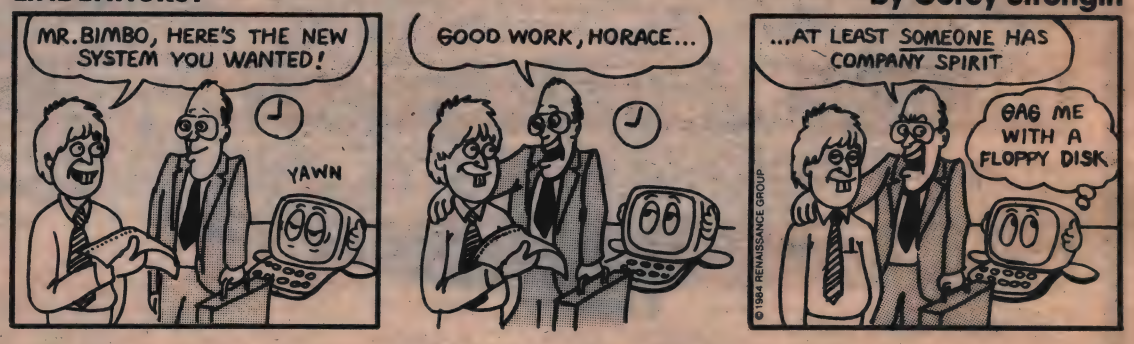
Welcome Sanyo And Heath/Zenith

As a result of our surveys and letters from readers Computer Shopper will now have a Sanyo section and a Heath/Zenith section. These will run as long as people contribute material for the sections. I am constantly getting letters asking for special sections of the magazine to be set up to support a computer brand. Why don't we have a Kaypro section? or a TI Professional section or a DEC Rainbow section? We do run plenty of articles on these computers but there is not enough activity from users to support a section. In the past we have had Portable Computer sections, Robotics sections and others. They were omitted only because article support for them disappeared or fell below the level needed to sustain a section of this magazine. I get plenty of press releases, but this magazine will never become a collection of press releases separating a sea of ads. Press releases are important, they are the equivalent of the AP wire for a magazine. However, a magazine can't only publish handouts. You buy Computer Shopper to learn something about computers and software and you can do it best by reading articles written by other users who have information to share with you.

Computer Shopper On Delphi

We are working with Delphi Network to set up a very unusual venture in electronic publishing. For those of you who do not know about it, Delphi is the Electronic Network that is becoming the home of the most interesting SIGS. It offers the computer hobbyist a meeting place and source of information and software at the lowest cost. Watch for future information. ●

LINDENHURST **by Corey Strongin**



Space Pen Ultrasonic

by Paul Terrell

Look, up in the sky, it's a Bird, it's a Plane, it's a Mouse with wings, it's a Koala Pad with booster rockets, no, it's a **Space Pen** from Soniture, Inc. A new Silicon Valley start-up that invites us all to enter the Third Dimension of Personal Computing with their new exciting and innovative product. Personally, invitations like that always bring out the worst in me as the worlds biggest skeptic. After all, I bought the first Apple One computer and I believed an Androbot would greet me at my door with a cocktail and a shoe shine.

So when I put my $175 into an envelope to get my paws on this new form of enlightenment for my Apple computer I was prepared for the worst, with mail delivery being what it is these days, it was two weeks before my surprise package arrived. I say surprise package because the contents were not complicated to operate considering the claims of the manufacturer.

Using the Space Pen

To enter the third dimension with my Apple computer, required the placement of a folding receiver frame about the size of a 12" ruler on the top and side of my color monitor. See fig. 1. Emerging from the end of the frame were two cables, one of which plugged into my I/O socket

Continued on page 188

BULLETIN

OCTIPLUS Inc., as an introductory offer, announces the sale of the Qumetrak 142 5 1/4" Floppy disk drive. This drive is approved for use in the IBM PC, Compatibles, and IBMPC jr. and in almost any other PC needing 5 1/4" 40 track 2 sided double density drives. The regular price of these drives is 199.00 but for a limited time we are offering these fast stepping drives for the fantastic price of just 69.95 per drive. Quantitys are LIMITED so OEM's and dealers need to move fast to insure timely delivery.

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Operating environment	
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FEEDBACK FORUM

Letters From Our Readers

Dear Editor,

In his column recently, Ted Drude made it a point to state that all the comments he makes about software are based on his personal use of a product which he has purchased or used through a friend. He further stated that because he had shelled out his hard earned cash, he felt he was more likely to point out the flaws in a product. That's great and I applaud his knowledge of his limit of objectivity. Since I'm not doing personal column format type articles for Computer Shopper, I don't have much of a chance to explain my reviewing techniques or software sources. So I thought I'd draft a letter offering the details.

I have a fairly consistent procedure that I follow, so that each package gets fair treatment. I turn no one down who offers me free software for review purposes. Whether or not I see the potential to sell a review, I don't think it's fair to just dismiss any software because it comes from a small publisher or has a ridiculously large price tag or is copy protected beyond belief.

If the package has been sent by an editor, then of course, I am obliged to give it a thorough look over before deciding to do it or not. Yes, there are packages that I have been highly reluctant to review. Most of these fall into a few categories that discourage me. They might require too much research, they may be written to do something I have no interest in (like dieting), or they may require some technical expertise which I don't have.

For instance, the paycheck I will receive for doing a review occasionally won't justify the research involved in using a program enough to give an accurate review. When you do software reviews for a living, you can't afford to spend months testing a program that you will in all probability never use again and then get paid $100 for. These types of reviews I leave to people who actually need to use the program. They will give a fair and accurate report of the programs abilities and short comings and be happy if they get paid a little on the side.

In some cases, I know the editor doesn't buy negative reviews and the package stinks. It's very hard to return a package to an editor, but in some cases it's unavoidable. Usually they don't want it back, they just take you're word for it that they don't want to review it anyway.

Once I've decided to do the review, I sit down with the documentation and read it through. When I sit down at the computer, I have a pretty good idea of what the program should do and how it does it. As I work with it, I keep the docs handy and write any observations on a pad I keep next to the computer. These comments will later be incorporated into the article, and can range anywhere from "The screen colors are poorly chosen" to "I crashed the program losing all my data because there wasn't any error trapping."

I try to do everything the package is supposed to do, using whatever equipment it is supposed to work with. I do take it for granted that Commodore programs work with Commodore printers because I use other manufacturers, printers (Mannesmann Talley and Epson). In some cases, I even get creative and use the program in ways other than the author's intention. Keeping in mind, of course that failure here isn't the programmer's fault. An example of this would be using an old data disk I had previously created with the new word processor that I'm reviewing. Or trying to edit an old data base file using the word processor.

If the package is aimed at a specific type of user (say a five year old child), I borrow one and watch him/her use the package. If I can get several kids, so much the better. The main point being to see how much trouble they have using the program and whether or not it meets the claims on the outside of the package.

Except for game programs (which he won't touch) I have my husband sit down and try the program. He is the type who totally disdains manuals and just plunges right in. I watch and see how far he gets before he becomes frustrated and grabs for the documentation. This gives me a good index of the package's "user-friendly-ness." Because he isn't familiar with the documentation, I watch to see how long it takes him to find the information he needs. This gives me another perspective on the quality of the manual.

If I run into a problem with the software, I usually call the support phone number and see how I get treated. I'll usually extend the conversation awhile to find out how knowledgeable the person at the other end is.

If possible, I try to avoid finding out the package's suggested list price until I've finished playing with the product and gotten a mental image of how much it should sell for. Because I've worked with more programs than most people, I think I have a pretty good idea what a fair price is. I then check the manufacturer's suggested list price and see how far off it is. If possible I check to see how much similar packages are selling for. This is usually the basis for my comments on whether or not I feel the program is worth the asking price.

When I sit down to write the article, I ask myself "If I didn't have this program, what would I want someone who knows the package to tell me, so that I could decide whether or not I'd want to buy it?" This is the information that I try to put into the article.

I also do hardware reviews and they are approached in the same way. Because my husband is a technical expert, I can call him in if the going gets rough. Because I know a bit more than the average user, I don't run into too many problems. When I do, it usually indicates a fairly serious problem with the product.

I have no problems with objectivity, because I feel that all software has the same chance to impress or depress me. Yes, I get depressed when a package doesn't work because I don't mess with packages that don't interest me (unless an editor I work with insists, in which case I develop an interest).

I mail out listings of the software I have on hand to editors and solicit assignments. This generally results in a couple review assignments each month. If an editor has a product he wants to see a review of, s/he's free to send me the package and give me the assignment. These are my main source of income and I have been doing them for almost three years, now.

With the new and excellent software that is being introduced each month, I look forward to doing this for some time to come. The new hardware that is being introduced has already got my husband and I trying to figure out where we're going to put two more computers in a room with three already resident.

I read more computer magazines than most people because I need to know what's out there before I can give accurate comparisons. As a reader, I like to think the other reviewers are most concerned with giving good, accurate information to help me make intelligent software buying decisions. (Yes, I do buy software. When I can find a package that I really need and don't feel that I should request a review copy of.) So I see reviews from both sides of the disk.

I hope this gives you some idea of what goes into my software reviews. I don't know how other reviewers work, so I can only speak for myself. Although I make a decent living at it, I feel that readers deserve good advice on software acquisitions.

I also like to recommend good software, because the companies that create decent programs tend to keep coming out with more good software. By pointing out small flaws, sometimes the companies will do upgrades or improve their product. And I think encouragement will keep them in the business of creating useful packages. So I want to help both the readers and the software companies. That's what I try to do with my reviews.

Please feel free to contact me through Computer Shopper, if you have any comments or questions. Like Ted, I wouldn't mind seeing some recommendations on what you readers would like to see.

Cheryl Peterson

Dear Mr Lewin,

You are quoted in the February 1, 1985 issue of The Lawyer's Microcomputer as part of the review of the Model 100 computer, saying that there is a "non-removable set of NiCads inside the computer."

I would like to alert you that the term nicad, spelled in any form is a registered trademark of SAFT America Inc. To use the term "nicad," you must indicate that this is a trademarked term. Otherwise, the generic term for this type of battery is "rechargeable" or "nickel-cadium."

I am certain that this is an oversight, and I would appreciate it if you would be alert to this trademark in the future.

Howard Mitchell
Senior Public Relations
Account Specialist
Keller-Crescent Co.
(Agency for SAFT America Inc.)

Dear Editor,

I note with interest your article How To Buy And Sell Used Computers. With the very high tech. today computers are out of date in just a few years and I have seen some excellent bargains in used computers. A short time ago a Burrows L7000 System was offered for $1000 — it was not sold for some time and I think it could have been purchased for $500.

An IBM #3741 with a #3717 printer was offered for $300. Just out of hospital I was a little short on cash so I asked if it could be bought for less. They said to make an offer, so I said $200. It cost be about $40 for a truck to haul it home, so I have a computer just 9 years old for $240. I think it is quite a bargain.

Back about 1970 I ran across a stack of GE computer boards in a surplus store. They were about 5-3/8" by 11" and were from second generation computers. Just loaded with transistors and parts. Power drivers, gates, wave shapers, multiplier counters, variable phase counters, decade scanners, disc. output, remainder registers, relay pullers, multiplier gates, and a resolver supply assembly; about 100 assorted boards. This was about the time GE gave up and about the time the 3rd generation computers were coming out. (I still have these).

Some time later, Olson of Akron was selling bags of computer boards and I bought several bags. These were smaller boards about 2-5/8x3" and were control data. In those days the price of computers was so high that the hobbyists could only dream about owning a computer. At that time I was working for a large company and they ordered some large machines that were computer equipped. These tape

Continued on page 104

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Understanding Computer
Continued from page 7

are used in color-TV picture tubes. The brightness of the emitted light is basically a function of how many electrons strike the molecule at any given instant. The larger the number of electrons, the brighter the glow; and conversely, the fewer the electrons, the dimmer the glow.

Now, let's take a look at the operation of a typical cathode ray tube (CRT for short)—the basic video display device.

As shown in Figure 1, a typical CRT is a glass enclosure formed by a narrow round neck containing the "electron gun" and its connecting socket, flaring to a large glass "bell," whose large end forms the viewing surface of the CRT. Located on the flare of the bell, is the connector for the very high voltage that produces the bright image on the screen.

In operation, the electrons are "boiled" off the front surface of the cathode when the cathode is heated by the red-hot filament (the glowing part of the electron gun as seen through the glass neck of the CRT).

The negative electrons emitted by the cathode are attracted to the high positive potential (10 to 30 kV, with this voltage dependent on the screen size of the CRT, and whether it is monochrome or color) present on the "ultor anode," a lining of electrically conductive material that coats the inside of the bell of the CRT.

The number of electrons that leave the electron gun is determined by a voltage (the video signal) applied to the control grid although, strictly speaking, there are other ways to control the amount of electrons gushing out of the gun. There are actually two familiar user-operated controls here. One is the brightness—a dc voltage control, while the other is called contrast—the video signal lever control.

The thick beam of electrons, now modulated by the video signal applied to the control grid, is then passed through the focus cylinder whose electrical potential is such that it electrically "squeezes" the beam so that it comes to a fine point on the phosphor coated on the rear surface of the glass faceplate of the CRT. Visible light is emitted where the electrons strike, with the glow visible through the heavy glass.

Under these conditions, all we would have is a bright spot at the center of the CRT screen.

Since an electron can be influenced by a magnetic field, the electron beam can be swept about the CRT screen in an orderly fashion by the unique magnetic field produced by an electromagnetic element called a "yoke," formed from many turns of fine wire, that encircles the slender neck of the CRT that contains the electron gun.

The yoke actually contains two independent inductors. One is called the "horizontal" coil and is mechanically arranged to cause the bright spot to sweep horizontally across the CRT screen to produce a fine line (sometimes called a trace). The other is called the "vertical" coil, and causes the swept line to move from the top of the CRT screen to the bottom.

As we now know, when the electron beam strikes the phosphor it creates a bright spot; however, when the beam moves away from that spot, the glow persists for some short time afterward. This is called "afterglow." The timing of the horizontal and vertical sweeps are arranged with the persistence of the CRT phosphor so that even though the sharply focused spot is being swept around the CRT screen, the afterglow makes it appear that the entire screen is illuminated at the same time. The bright set of CRT lines is called a "raster."

All that is left now is to remind the reader that the signal applied to the control grid of the electron gun that determines how many electrons leave the gun is called the "video" signal, the voltage applied to the focus element is obviously called the "focus" voltage, the signal applied to the horizontal yoke coil is called the "horizontal sweep", and the signal applied to the vertical yoke coil is called the "vertical sweep."

The reader is WARNED that the voltage applied to the "ultor anode"—via an insulated clip on the broad bell of the CRT—can reach up to 30-45 kV, quite enough to cause problems for a human if he/she should contact it. Therefore, please do not mess with the insulated protective cover, and leave all servicing that involves the CRT to a qualified service technician.

Raster Scan

The basic block diagram of a raster-scan sweep circuit, found in almost all video devices is shown in Figure 2.

The horizontal oscillator generates a "sawtooth"-type voltage signal that is fed to the horizontal output stage where it is converted into a "sawtooth"-type current signal that is applied to the horizontal portion of the CRT yoke. The vertical oscillator and its associated output stage does essentially the same thing for the vertical portion of the yoke.

A "sawtooth" waveform (see the insert in Figure 2) is essentially a waveform whose amplitude rises linearly at a relatively slow rate (trace) until it reaches a predetermined value. At that point, the voltage is brought—very rapidly—back to the original value (retrace). Obviously, a number of these waveforms will appear on an oscilloscope as a series of "sawteeth"—hence the name.

Although not part of the horizontal sweep circuit, the high-voltage generator is "powered" from the horizontal sweep circuit and generates the very high voltages (10 to 30 kV) required by the CRT final anode to produce a bright

Continued on page 182

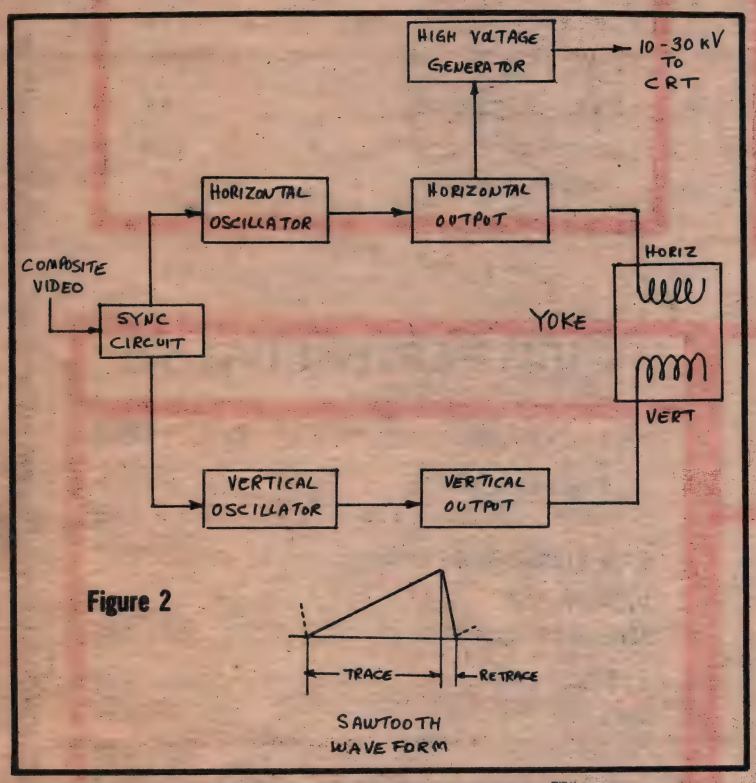

Figure 2

SAWTOOTH WAVEFORM GENERATOR

How Color CRTs Work

by L. Van Delray

Back at the beginning of this series, we discussed the operation of a conventional monochrome (one color, usually white or green on black) cathode ray tube (CRT). In this section, we will discuss the basics of a color CRT.

As we now know, when an electron beam strikes the phosphor of the CRT, the resulting energy exchange creates a spot of light, whose color is essentially a function of the chemical that makes up the phosphor. Thus, simply by selecting the type of phosphor, the CRT manufacturer can determine the final displayed color.

Obviously, to create a color image on the CRT we should use a number of electron guns, each aimed at a different colored phosphor. . . but how many guns, how many different colors, and which ones to use?

To understand the basic of a color CRT, we must learn a little about color. The perception of color is purely psychophysiological. There is no "real" color--the radiations that occur when the electron beam strikes the phosphor produces an optical sensation that we have been taught to associate with a specified color name.

We have all played with a prism. When using this optical device, we notice that when a slender beam of white light (usually sunlight) is passed through the prism, it breaks up into a very pretty rainbow of colors from violet too deep red (as shown in Figure 1A).

However, if you go the opposite way, that is, if we take some colors and pass them through the prism in the correct proportions, sure enough, a beam of white light will be produced. This is shown in Figure 1B.

Interestingly enough, experiments prove that white light can be produced by using the right proportion of only three colors--as long as a mixture of two cannot be used to produce the third. The three so-called "primary" colors selected were red, green, and blue.

There are two basic ways to combine three colors to create a panoply of other colors including white. These are called "subtractive" (used in printing) and "additive" (light emitting and as used in color TV).

Since we are dealing with color-TV, let us look at additive colors. Figure 2 shows that a brightness combination of red (30%), green (59%), and blue (11%) can be combined to form other colors including white.

Thus, the CRT manufacturer has to create a CRT having three electron guns--one for each color--with each gun "aimed" at its pertinent color emitting phosphor affixed to the rear of the faceplate of the CRT.

Although CRT manufacturers use different types (and numbers) of electron guns and may lay their color emitting

Continued on page 180

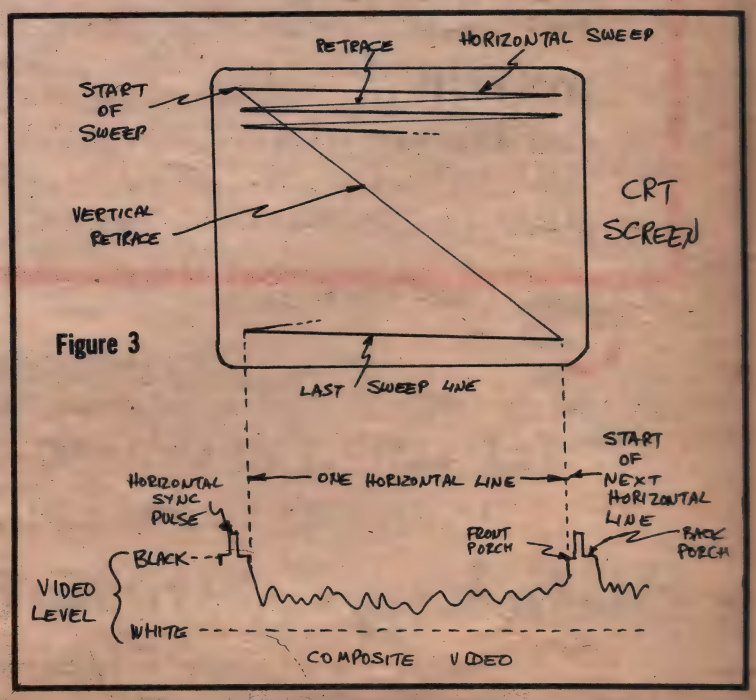

Figure 3

CRT SWEEP DIAGRAM

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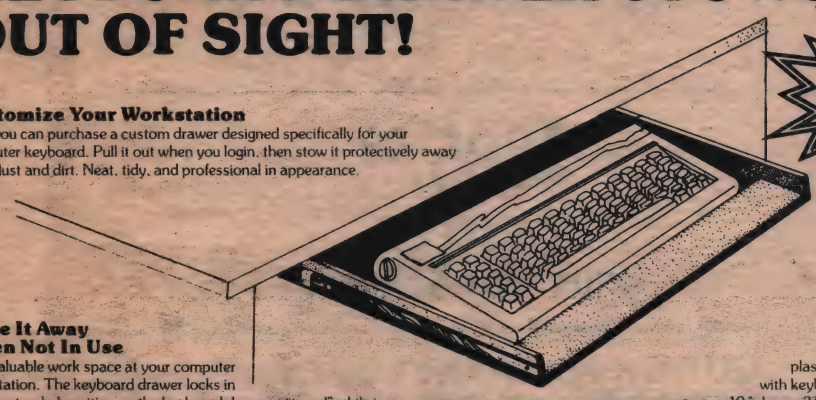

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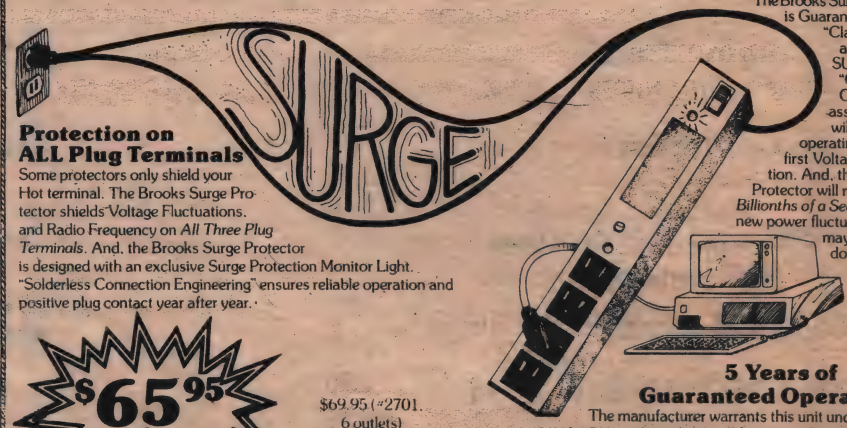

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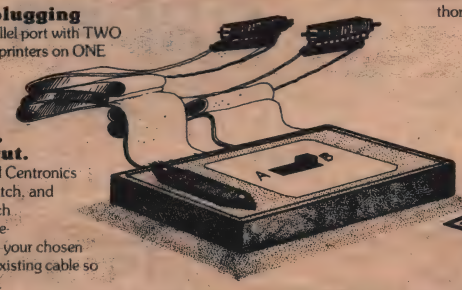

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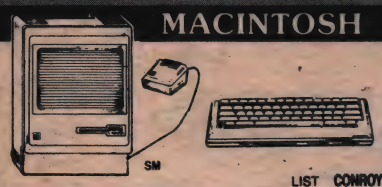

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Advantage™ Multif. Bd. for AT, 128K	$ 595	$ 445
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I/O Plus II, S/P/CC/G	$ 265	$ 185
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Port Kits - ser, para, or game, ea.	$ 50	$ 39
MonoGraphPlus™ P/CC (for Lotus)	$ 495	$ 375
COMX, NEW EconoRAM™ Plus, 384K to 1.5 meg. board, S/P/CC/G Fastrak & Spooler		$265
EconoRAM™, full 384K board	$ 295	$ 195
HAUPPAGE (HCW), 8087 Chip	$ 175	$ 129
8087 Math Pak (Chip & softw.)	$ 295	$ 235
HAYES, Mach II Joystick	$ 45	$ 29
Mach III (PC or Jr.)	$ 55	$ 35
HERCULES, Color Card w/para.	$ 245	$ 169
Mono Graphics Card	$ 499	$ 329
KENSINGTON, Masterpiece™	$ 140	$ 99
PC Saver™ Line Cord w/Filter	$ 50	$ 35
KEY TRONIC, KB5151, Std. Keyboard	$ 255	$ 195
KOALA, Speed Key System	$ 100	$ 63
Speed Key Tablet w/software	$ 200	$ 115
Koala Pad w/PC Design	$ 150	$ 89
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Multifunction (6) Card	$ 89	$ 79
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Memory Card 256K	$ 495	$ 395
Floppy Cont. Card (accepts 3 modules)	$ 265	$ 205
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Hard Disk Cable	$ 30	$ 27
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Game Adapter Module	$ 49	$ 43
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Memory Module 256K	$ 422	$ 357

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MOUSE SYSTEMS, PC Mouse & Paint	$ 295	$ 140
PARADISE, Modular Graphics Card	$ 395	$ 285
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PERSYST, NEW PC/Mono Board, w/para port	$ 250	$ 195
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BOB Board Color Adapter, hi res.	$ 595	$ 465
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Quadboard, no RAM, expand to 384K	$ 295	$ 225
Quadboard 256K, to 384K, S/P/CC	$ 395	$ 295
Quadboard, 384K (full), S/P/CC/G	$ 795	$ 495
Quadboard II, no RAM, to 256K	$ 295	$ 215
Quadboard II, 64K, to 256K, 2S/CC	$ 395	$ 265
Quadboard II, 256K, 2S/CC	$ 595	$ 395
Quad 512 + 64K w/serial port	$ 325	$ 245
Quadcolor I, board, 4 colors	$ 295	$ 195
Upgrade Quadcolor I to II kit	$ 275	$ 199
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Quad 3278	$1195	$1050
Quadnet VI	$2295	$1545
Quadnet IX	$1995	$1745
Quadlink	$ 495	$ 385
Quadsprint	$ 645	$ 495
TG PRODUCTS, Joystick	$ 45	$ 29
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KOALA, Touch Tablet for Jr.	$ 125	$ 75
MICROSOFT, Booster 128K w/Mouse	$ 495	$ 339
MOUSE SYSTEMS, Mouse (for Jr.)	$ 195	$ 125
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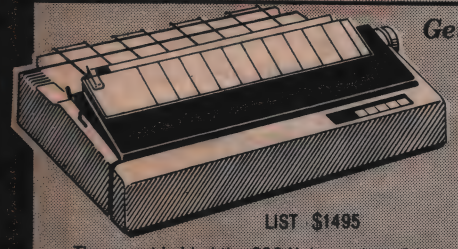

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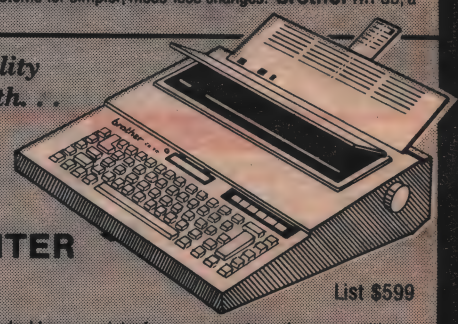

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SN74283N	16	1.39
SN74284N	16	2.95
SN74285N	16	2.95
SN74365N	16	.55
SN74366N	16	.55
SN74367N	16	.55
SN74368N	16	.55
SN74390N	16	1.49
SN74393N	14	1.49

74LS

74LS00	14	.29
74LS01	14	.29
74LS02	14	.35
74LS03	14	.29
74LS04	14	.39
74LS05	14	.35
74LS08	14	.35
74LS09	14	.35
74LS10	14	.35
74LS11	14	.35
74LS14	14	.59
74LS15	14	.35
74LS20	14	.29
74LS21	14	.35
74LS26	14	.29
74LS27	14	.35
74LS28	14	.39
74LS30	14	.39
74LS32	14	.39
74LS37	14	.35
74LS38	14	.39
74LS42	16	.49
74LS47	16	.89
74LS51	14	.29
74LS73	14	.39
74LS74	14	.49
74LS75	16	.45
74LS76	16	.39
74LS85	16	.89
74LS86	14	.39
74LS90	14	.55
74LS92	14	.55
74LS93	14	.59
74LS96	16	.89
74LS107	14	.39
74LS109	16	.39
74LS112	16	.45
74LS114	14	.39
74LS122	14	.49
74LS123	16	.79
74LS125	14	.59
74LS126	14	.59
74LS132	14	.65
74LS133	16	.59
74LS136	14	.39
74LS138	16	.59
74LS139	16	.59
74LS145	16	1.19
74LS147	16	1.95
74LS148	16	1.79
74LS151	16	.59
74LS153	16	.59
74LS154	24	1.49
74LS155	16	.69
74LS156	16	.69
74LS157	16	.69
74LS158	16	.59
74LS160	16	.69
74LS161	16	.69
74LS162	16	.69
74LS163	16	.69
74LS164	14	.89
74LS165	16	.89
74LS168	16	1.19
74LS169	16	1.49
74LS170	16	1.49
74LS173	16	.69
74LS174	16	.69
74LS175	16	.69
74LS181	24	2.49
74LS190	16	.79
74LS191	16	.89
74LS192	16	.79
74LS193	16	.89
74LS194	16	.69
74LS195	16	.59
74LS196	14	.89
74LS221	16	1.09
74LS240	20	1.09
74LS241	20	.99
74LS243	14	1.09
74LS244	20	1.29
74LS245	20	1.49
74LS251	16	.59
74LS253	16	.59
74LS257	16	.59
74LS258	16	.59
74LS260	14	.59
74LS266	14	.49
74LS273	20	1.49
74LS279	16	.49
74LS280	14	1.95
74LS283	16	1.09
74LS290	16	1.95
74LS293	20	1.95
74LS299	20	2.95
74LS322	20	3.95
74LS323	20	3.95
74LS347	16	.79
74LS353	16	1.09
74LS364	20	1.95
74LS365	16	.49
74LS366	16	.49
74LS367	16	.49
74LS368	16	.49
74LS373	20	1.49
74LS374	20	1.49
74LS375	16	.69
74LS386	14	.39
74LS393	14	1.19
74LS399	16	1.49
74LS490	16	1.95
74LS533	20	1.95
74LS534	20	1.95
74LS540	20	1.49
74LS541	20	1.49
74LS640	20	2.19
74LS641	20	2.19
74LS644	20	2.19
74LS645	20	2.19
74LS670	16	1.49
74LS688	20	2.95
81LS95	20	1.49
81LS96	20	1.49
81LS97	20	1.49
81LS98	20	1.49

74S/PROMS*

74S00	14	.35
74S02	14	.35
74S03	14	.35
74S04	14	.45
74S05	14	.45
74S08	14	.45
74S09	14	.39
74S10	14	.35
74S11	14	.35
74S15	14	.35
74S20	14	.35
74S22	14	.35
74S30	14	.35
74S32	14	.45
74S37	14	.99
74S38	14	.89
74S51	14	.35
74S64	14	.39
74S65	14	.39
74S74	14	.55
74S85	16	1.99
74S86	14	.55
74S112	16	.55
74S113	14	.55
74S114	14	.55
74S124	16	2.75
74S132	14	1.89
74S133	16	.45
74S135	16	.89
74S136	14	1.39
74S138	16	.89
74S139	16	.89
74S140	14	.69
74S151	16	.99
74S153	16	.99
74S157	16	.99
74S158	16	.99
74S160	16	2.29
74S169	16	4.29
74S174	16	1.09
74S175	16	1.09
74S188*	16	1.75
74S194	16	1.49
74S195	16	1.49
74S196	14	1.49
74S240	20	1.95
74S241	20	1.95
74S242	14	2.19
74S243	14	2.19
74S244	20	2.19
74S251	16	.99
74S253	16	.99
74S257	16	.99
74S258	16	.99
74S260	14	.79
74S273	20	2.39
74S280	14	1.89
74S287*	16	1.79
74S288*	16	1.79
74S299	20	5.95
74S373	20	2.49
74S374	20	2.49
74S387*	16	1.95
74S471*	28	4.95
74S472*	28	4.95
74S473*	20	4.95
74S570*	16	2.95
74S571*	16	2.95
74S572*	16	4.95
74S573*	16	4.95

CA—LINEAR

CA3046N	14	.99
CA3054N	14	1.09
CA3059N	14	2.95
CA3060N	16	2.95
CA3065E	14	1.49
CA3080E	8	.99
CA3081N	16	1.15
CA3082N	16	1.15
CA3083N	16	1.15
CA3086N	14	.85
CA3089N	16	1.95
CA3096N	16	1.75
CA3127E	16	1.95
CA3130E	8	1.19
CA3140E	8	.85
CA3160H		1.79
CA3160E	8	1.49
CA3161E	16	1.79
CA3162E	16	6.95
CA3189E	16	2.79
CA3401N	14	.59

CD—CMOS

CD4001	14	.29
CD4002	14	.29
CD4006	14	.89
CD4007	14	.29
CD4008	16	.89
CD4009	16	.59
CD4010	16	.49
CD4011	14	.29
CD4012	14	.29
CD4013	14	.39
CD4014	16	.89
CD4015	16	.39
CD4016	14	.49
CD4017	16	.79
CD4018	16	.79
CD4019	16	.49
CD4020	16	.75
CD4021	16	.75
CD4022	16	.75
CD4023	14	.29
CD4024	14	.69
CD4025	14	.29
CD4026	16	1.59
CD4027	16	.45
CD4028	16	.69
CD4029	16	.79
CD4030	14	.39
CD4034	24	1.79
CD4035	16	.79
CD4040	16	.75
(More in Catalog)		
CD4041	14	.69
CD4042	16	.69
CD4043	16	.79
CD4044	16	.79
CD4046	16	.89
CD4047	14	.89
CD4048	16	.59
CD4049	16	.39
CD4050	16	.39
CD4051	16	.79
CD4052	16	.89
CD4053	16	.79
CD4056	16	2.95
CD4059	24	3.95
CD4060	16	.89
CD4066	14	.45
CD4068	14	.39
CD4069	14	.35
CD4070	14	.29
CD4071	14	.29
CD4072	14	.29
CD4073	14	.29
CD4077	14	.35
CD4078	14	.49
CD4081	14	.29
CD4093	14	.49
CD4094	16	1.95
CD4098	16	1.95
CD4099	16	1.89
CD4503	16	.69
CD4506	16	1.29
CD4507	14	1.19
CD4508	24	1.95
CD4510	16	.85
CD4511	16	.85
CD4512	16	.85
CD4514	24	1.49
CD4515	24	1.49
CD4516	16	.89
CD4518	16	.89
CD4519	16	.59
CD4520	16	.89
CD4526	16	1.19
CD4528	16	1.19
CD4529	16	1.69
CD4531	16	.89
CD4538	16	1.49
CD4541	14	1.49
CD4543	16	1.19
CD4566	16	2.95
CD4583	16	2.49
CD4584	14	.59
CD4723	16	1.19
CD4724	16	1.19
MC14410	16	8.95
MC14411	24	11.95
MC14412	16	7.95
MC14433	24	17.95
MC14490P	16	4.95
MC14572	16	1.19

RED-HOT RAM & EPROM PRICES

Part No.	Description	Price
21C14	(200ns) CMOS SRAM CMOS USES LESS POWER	.99
27C16	(450ns) CMOS EPROM	12.95
4164N-200	(DRAM)	2.25-9/19.95
6116P-4	(200ns) SRAM	3.49
6116LP-4	(200ns) L.P. SRAM	3.95
6264P-15	(150ns) SRAM	12.49
6264LP-15	(150ns) L.P. SRAM	12.95
27128-25	(250ns) EPROM	9.95
41256-200	(200ns) DRAM	10.95
68764	(450ns) 21V EPROM	14.95
EWC-1	EPROM Window Covers	10/.69

MICROPROCESSOR COMPONENTS

MICROPROCESSOR CHIPS

Part No.	Pins	Function	Price
D765AC	40	Floppy Disk Controller	16.95 ~~19.95~~
D3242	28	Addr. Multiplexer & Refresh Counter	7.95
TMS5501	40	Synchronous Data Interface (SIRC)	14.95
Z80	40	CPU (MK3880N) (780C) 2.5MHz	2.75 ~~2.95~~
Z80-CTC	28	Counter Timer Circuit	3.49
Z80-DART	40	Dual Asynchronous Rec./Trans.	8.95
Z80-DMA	40	Direct Memory Access Circuit	12.49
Z80-P10	40	Parallel I/O Interface Controller	2.95 ~~3.49~~
Z80-S10/0	40	Serial I/O (TxCB and RxCB Bonded)	11.49
Z80-S10/1	40	Serial I/O (Lacks DTRB)	11.49
Z80-S10/2	40	Serial I/O (Lacks SYNCB)	11.49
Z80-S10/9	40	Serial I/O	11.49
Z80A	40	CPU(MK3880N-4) (780C-1) 4MHz	2.95 ~~3.49~~
Z80A-CTC	28	Counter Timer Circuit	3.95 ~~4.49~~
Z80A-DART	40	Dual Asynchronous Rec./Trans.	9.95
Z80A-DMA	40	Direct Memory Access Circuit	12.95
Z80A-P10	40	Parallel I/O Interface Controller	3.95
Z80A-S10/0	40	Serial I/O (TxCB and RxCB Bonded)	11.95
Z80A-S10/1	40	Serial I/O (Lacks DTRB)	11.95
Z80A-S10/2	40	Serial I/O (Lacks SYNCB)	11.95
Z80A-S10/9	40	Serial I/O	11.95
Z80B	40	CPU (MK3880N-6) 6MHz	8.95
Z80B-CTC	28	Counter Timer Circuit	11.95
Z80B-DART	40	Dual Asynchronous Rec./Trans.	19.95
Z80B-P10	40	Parallel I/O Interface Controller	10.95
Z8001B	48	CPU Segmented (10MHz)	79.95
Z8002B	40	CPU Non-Segmented (10MHz)	59.95

6500/6800/68000 SERIES

6502	40	MPU with Clock (1MHz)	4.95
6502A	40	MPU with Clock (2MHz)	6.49
6502B	40	MPU with Clock (3MHz)	8.95
6520	40	Peripheral Inter. Adapter	3.95
6522	40	Versatile Inter. Adapter	5.49
6551	28	Async. Comm. Interface Adapt.	6.95 ~~10.95~~
6800	40	MPU	2.95
6802CP	40	MPU with Clock and RAM	5.95 ~~7.95~~
6809	40	CPU — 8-Bit (On-Chip Oscillator)	8.95
6809E	40	CPU — 8-Bit (External Clocking)	9.95
68B09E	40	CPU — 8-Bit (Ext. Clocking) 2MHz	14.95
68B10	24	128x8 Static RAM (2MHz)	5.95
6821	40	Peripheral Inter.Adapt.(MC6820)	2.75 ~~2.95~~
68B21	40	Peripheral Interface Adapter (2MHz)	5.95
6845	40	CRT Controller (CRTC)	9.95 ~~14.95~~
68B45	40	CRT Controller (CRTC) 2MHz	14.95 ~~19.95~~
6850	24	Asynchronous Comm. Adapter	3.95
6860	24	0-600bps Digital MODEM	7.95
68000L8	64	MPU 16-Bit (8MHz)	39.95
68488P	40	General Purpose Int. Adapter	9.95

8000/80000 SERIES

8031	40	Control Oriented CPU w/RAM & I/O	12.95 ~~14.95~~
8035	40	MPU — 8-Bit	4.95 ~~5.95~~
8039	40	CPU—Sgl. Chip 8-Bit (128bts. RAM)	4.95 ~~5.95~~
8040N-6	40	CPU (256 bytes RAM)	9.95
8060	40	CPU — 8-Bit NMOS	12.95 ~~14.95~~
8073N	40	CPU w/Basic Micro Interpreter	29.95
8080A	40	CPU	3.95
8085A	40	CPU	4.95
8085A-2	40	CPU-8-Bit N-Channel (5MHz)	10.95 ~~11.95~~
8086-2	40	CPU 16-bit 8MHz	19.95 ~~24.95~~
8087	40	Arithmetic Processor	149.95 ~~169.95~~
8088	40	CPU 8/16-Bit	14.95 ~~19.95~~
8155	40	HMOS RAM I/O Port-Timer	4.95 ~~6.95~~
8156	40	RAM with I/O Port and Timer	6.95 ~~8.95~~
8205	16	Hi Speed 1 out of 8 Binary Decoder	3.95
8212	24	8-Bit Input/Output (74S412)	2.95
8224	16	Clock Generator/Driver	2.95
8228	28	Sys. Cont./Bus Driver (74S428)	3.95 ~~4.95~~
8237-5	40	High Perf. Prog. DMA Cont. (5MHz)	14.95 ~~19.95~~
8238	28	System Controller (74S438)	4.95
8243	24	I/O Expander for 48 Series	3.95 ~~4.95~~
8250N	40	Async. Comm. Element	10.95
8251	28	Prog. Comm. I/O (USART)	4.49 ~~4.95~~
8251A	28	Prog. Comm. Interface (USART)	4.95 ~~7.95~~
8253	24	Prog. Interval Timer	5.95 ~~6.95~~
8255	40	Prog. Peripheral I/O (PPI)	4.49 ~~4.95~~
8255A-5	40	Prog. Peripheral I/O (PPI) 5MHz	4.95 ~~7.95~~
8259	28	Prog. Interrupt Control	5.95
8272	40	Sgle/Dble Density Floppy Disk Cont.	16.95 ~~19.95~~
8274	40	Multi-Protocol Serial Cont. (7201)	14.95 ~~29.95~~
8279	40	Prog. Keyboard/Display Interface	6.95
8282	20	Octal Latch	6.49 ~~8.95~~
8284	18	Clock Generator/Driver	5.49 ~~6.95~~
8286	20	Octal Bus Transceiver	6.49 ~~7.95~~
8287	20	Octal Bus. Transceiver (Inverted)	6.49 ~~7.95~~
8288	20	Bus Controller	14.95 ~~19.95~~
8303	20	8-Bit Tri-State Bi-Directional Trans.	3.49
8304	20	8-Bit Bi-Directional Receiver	3.49
8310	20	Octal Latched Peripheral Driver	3.95
8741	40	8-Bit Univ. Peripheral Interface	19.95 ~~29.95~~
8748	40	HMOS EPROM MPU	19.95 ~~39.95~~
8749	40	MPU 8-Bit (EPROM Version of 8049)	24.95 ~~39.95~~
8755	40	16K EPROM with I/O	39.95
80186-6	68	High Integration 16-Bit MPU	99.95
80188	68	High Integra. 16-Bit MPU (8-Bit Data Bus)	89.95

SPECIAL FUNCTION

DS0026CN	8	Dual MOS Clock Driver (5MHz)	1.95
INS2651	28	Communication Chip	7.95
MC3470P	18	Floppy Disk Read Amp System	4.95
MM5321N	16	TV Camera Sync. Generator	9.95
MM54240N	24	Asynchronous Transmitter/Receiver	5.95
MM58167AN	24	Microprocessor Real Time Clock	8.95
MM58174AN	16	Micro. Compatible Time Clock	8.95
MM5369AA/N	8	Prog. Oscillator/Divider (60Hz)	1.79
MM5369EST	8	Prog. Oscillator/Divider (100Hz)	1.95

DYNAMIC RAMS

Part No.	Pins	Function	Price
1103	18	1024x1 (300ns)	.99
4027	16	4096x1 (250ns)	1.49
4116N-15	16	16,384x1 (150ns)	1.39 — 8/10.95
4116N-20	16	16,384x1 (200ns)	.79-8/6.29 ~~1.15-8/8.95~~
4116N-25	16	16,384x1 (250ns)	.69-8/5.49 ~~.89-8/6.95~~
4164N-150	16	65,536x1 (150ns)	2.49-9/21.95 ~~5.19-8/40.95~~
4164N-200	16	65,536x1 (200ns)	2.25-9/19.95 ~~4.95-8/38.95~~
MM5261	18	1024x1 (300ns)	.35 — 8/1.95
MM5262	22	2048x1 (365ns)	.35 — 8/1.95
MM5270	18	4096x1 (250ns)	4.95
MM5280	22	4096x1 (200ns) 2107	3.95
MM5298-3	16	8192x1 (200ns)	.59
41256-150	16	262,144x1 (150ns)	11.49 ~~34.95~~
41256-200	16	262,144x1 (200ns)	10.95 ~~31.95~~
48128	16	131,072x1 (250ns)	19.95 ~~24.95~~

STATIC RAMS

2101	22	256x4 (450ns) 8101	1.95
2102	16	1024x1 (350ns)	.89
2102-2L	16	1024x1 (250ns) L.P. (91L02)	1.49
2111	18	256x4 (450ns) 8111	2.49
2112	16	256x4 (450ns) MOS	2.49
2114N	18	1024x4 (450ns)	1.29 — 8/9.95
2114N-L	18	1024x4 (450ns) L.P.	1.65 — 8/12.95
2114N-2	18	1024x4 (200ns)	1.39 — 8/10.95
2114N-2L	18	1024x4 (200ns) L.P.	1.69 — 8/13.49
2147HN	18	4096x1 (70ns)	4.49
2148HN	18	1024x4 (70ns)	4.95
TMS4045	18	1024x4 (450ns)	3.95
TMS40L47-45	20	1024x4 (450ns)	1.95
5101	22	256x4 (450ns) CMOS	3.95
MM5257	18	4096x1 (450ns) 4044	4.95
HM6116P-2	24	2048x8 (120ns) CMOS	5.49 ~~7.95~~
HM6116LP-2	24	2048x8 (120ns) L.P. CMOS	6.49 ~~8.95~~
HM6116P-3	24	2048x8 (150ns) CMOS	3.95 ~~4.95~~
HM6116LP-3	24	2048x8 (150ns) L.P. CMOS	4.95 ~~6.49~~
HM6116P-4	24	2048x8 (200ns) CMOS	3.49 ~~4.75~~
HM6116LP-4	24	2048x8 (200ns) L.P. CMOS	3.95 ~~5.49~~
HM6264P-12	28	8192x8 (120ns) CMOS	14.49 ~~37.95~~
HM6264LP-12	28	8192x8 (120ns) L.P. CMOS	14.95 ~~39.95~~
HM6264P-15	28	8192x8 (150ns) CMOS	12.49 ~~34.95~~
HM6264LP-15	28	8192x8 (150ns) L.P. CMOS	12.95 ~~37.95~~
27LS00	16	256x1 (80ns) L.P.	3.95
7489	16	16x4 (50ns) 3101	2.25
74C921	18	256x4 (250ns) CMOS	5.95
74C930	18	1024x1 (250ns) CMOS (6518)	5.95
74S189	16	16x4 (35ns) 93405	2.95
74S289	16	16x4 (35ns) 3101	2.95
82S10	16	1024x1 (50ns) O.C. (93415)	3.95
82S25	16	16x4 (50ns) O.C. (74S289)	2.25

PROMS/EPROMS

1702A	24	256x8 (1μs)	3.95
2708	24	1024x8 (450ns)	3.95
TMS2516	24	2048x8 (450ns) 2716	4.95
TMS2532	24	4096x8 (450ns) NMC2532	5.49
TMS2564	28	8192x8 (450ns)	10.95
TMS2716	24	2048x8 (450ns) 3 voltage	7.95
2716	24	2048x8 (450ns)	3.95
27C16	24	2048x8 CMOS	12.95 ~~14.95~~
2716-1	24	2048x8 (350ns)	5.49
2716Q-5	24	2048x8 (550ns)	3.75
2732	24	4096x8 (450ns)	4.95
2732A-20	24	4096x8 (200ns) 21V	11.49
2732A-25	24	4096x8 (250ns) 21V	7.19
2732A-45	24	4096x8 (450ns) 21V	4.95 ~~6.49~~
27C32	24	4096x8 CMOS	14.95 ~~19.95~~
27C32A-30	24	4096x8 (300ns) 21V (CMOS)	22.95
2764-20	28	8192x8 (200ns) 21V	9.95 ~~14.95~~
2764-25	28	8192x8 (250ns) 21V	7.19
2764-45	28	8192x8 (450ns) 21V	6.49
27C64	28	8192x8 CMOS 21V	14.95 ~~22.95~~
27128-25	28	16,384x8 (250ns) 128K 21V	9.95 ~~21.95~~
27256-25	28	32,768x8 (250ns) 256K (14V)	19.95 ~~99.95~~
MCM68764	24	8192x8 (450ns) 21V	14.95 ~~24.95~~
74S188	16	32x8 PROM O.C. (6330-1)	1.75
74S287	16	256x4 PROM T.S. (6301-1)	1.79
74S288	16	32x8 PROM T.S. (6331-1)	1.79
74S387	16	256x4 PROM O.C. (6300-1)	1.95
74S471	20	256x8 PROM T.S. (6309-1)	4.95
74S472	28	512x8 PROM T.S. (6349-1)	4.95
74S473	28	512x8 PROM O.C. (6348)	4.95
74S474	24	512x8 PROM T.S. (DM87S296N)	4.95
74S475	24	512x8 PROM O.C. (6340)	4.95
74S476	18	1024x4 PROM T.S.	6.95
74S478	24	1024x8 PROM T.S.	9.95
74S570	16	512x4 PROM O.C. (6305)	2.95
74S571	16	512x4 PROM T.S. (6306)	2.95
74S572	18	1024x4 PROM O.C. (6352)	4.95
74S573	18	1024x4 PROM T.S. (82S137)	4.95
82S23	16	32x8 PROM O.C. (27S18)	2.95
82S115	24	512x8 PROM T.S. (27S15)	9.95
82S123	16	32x8 PROM T.S. (27S19)	2.95
82S126	16	256x4 PROM O.C. (27S20)	2.95
82S129	16	256x4 PROM T.S. (27S21)	2.95
82S130	16	512x4 PROM O.C. (27S12)	4.95
82S185	18	2048x4 PROM T.S. (TBP24S81)	9.95
82S191	24	2048x8 (80ns)	14.95
DM87S181N	24	1024x8 PROM T.S. (82S181)	9.95
DM87S184N	18	2048x4 PROM O.C. (82S184)	9.95
DM87S185N	18	2048x4 PROM T.S. (82S185)	9.95
DM87S191N	24	2048x8 PROM T.S. (82S191)	14.95

DATA ACQUISITION

DC10		Mostek DC/DC Converter +5V to −9V	2.95
ADC0801	20	8-Bit A/D Converter (1/4LSB)	14.95
ADC0803	20	8-Bit A/D Converter (±1/2LSB)	4.95
ADC0804	20	8-Bit A/D Converter (1LSB)	3.49
ADC0808	28	8-Bit A/D Conv. w/8-Channel Analog	9.95
ADC0809	28	8-Bit A/D Converter (8-Ch. Multi.)	4.49
ADC0816	40	8-Bit A/D Conv. w/16-Channel Analog	14.95
ADC0817	40	8-Bit A/D Converter (16-Ch. Multi.)	9.49
DAC0806	16	8-Bit D/A Converter (0.78% Lin.)	1.95
DAC0807	16	8-Bit D/A Converter (MC1408-7)	1.49
DAC0808	16	8-Bit D/A Converter (MC1408-8)	2.25
DAC0830	20	8-Bit Up D/A Conv. (.05% Lin.)	5.95
DAC0831	20	8-Bit Up D/A Conv. (.10% Lin.)	4.49
DAC1000	24	10-Bit D/A Conv. Micro. Comp. (0.05%)	7.95
DAC1008	20	10-Bit D/A Conv. Micro Comp. (0.20%)	6.95
DAC1022	16	10-Bit D/A Conv. (0.20% lin.)	5.95
DAC1222	18	12-Bit D/A Conv. (0.20% Lin.)	6.95
DAC1230	20	12-Bit Up D/A Conv. (.05% Lin.)	14.95
DAC1231	20	12-Bit Up D/A Conv. (.10% Lin.)	13.95
AY-3-1015D	40	25K Baud UART	3.95
AY-5-1013A	40	30K Baud UART (TR1602)	3.95

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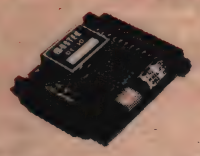
Commodore Accessories



RS232 Adapter for VIC-20 and Commodore 64

The JE232CM allows connection of standard serial RS232 printers, modems, etc. to your VIC-20 and C-64. A 4-pole switch allows the inversion of the 4 control lines. Complete installation and operation instructions included.

• Plugs into User Port • Provides Standard RS232 signal levels • Uses 6 signals (Transmit, Receive, Clear to Send, Request to Send, Data Terminal Ready, Data Set Ready).

JE232CM $39.95

VOICE SYNTHESIZER FOR APPLE AND COMMODORE

• Over 250 word vocabulary - affixes allow the formation of more than 500 words • Built-in amplifier, speaker, volume control, and audio jack • Recreates a clear, natural male voice • Plug-in user ready with documentation and sample software • Case size: 7¼"L x 3¼"W x 1-3/8"H

APPLICATIONS: • Security Warning • Teaching • Instrumentation • Telecommunication • Handicap Aid • Games

Part No.	Description	Price
JE520CM	For Commodore 64 & VIC-20	$114.95
JE520AP	For Apple II, II+, and *IIe*	$149.95

Computer Memory Expansion Kits

IBM PC, PC XT and Compatibles

Most of the popular Memory Boards (e.g. Quadram™ Expansion Boards) allow you to add an additional 64K, 128K, 192K or 256K. The IBM64K Kit will populate these boards in 64K byte increments. The Kit is simple to install – just insert the 9 - 64K RAM chips in the provided sockets and set the 2 groups of switches. Complete conversion documentation included.

IBM64K (Nine 200ns 64K RAMs). $19.95

IBM PC AT

Each kit comes complete with nine 128K dynamic RAMs and documentation for conversion.

IBM128K (Nine 250ns 128K RAMs). . . . $174.95

APPLE *IIe*

Extended 80-Column/64K RAM Card. Expands memory by 64K to give 128K when used with programs like VisiCalc™. Fully assembled and tested.

JE864. . . . . $99.95

TRS-80 MODEL I, III

Each Kit comes complete with eight MM5290 (UPD416/4116) 16K Dynamic RAMs and documentation for conversion. Model 1: 16K equipped with Expansion Interface can be expanded to 48K with 2 Kits. Model III: Can be expanded from 16K to 48K using 2 Kits. Each Kit will expand computer by 16K increments.

TRS-16K3 200ns (Model III). $6.29
TRS-16K4 250ns (Model 1). $5.49

TRS-80 MODEL IV & 4P

Easy to install Kit comes complete with 8 ea. 4164N-20 (200ns) 64K Dynamic RAMs and conversion documentation. Converts TRS-80 Model IV computers from 16K to 64K. Also expands Model 4P from 64K to 128K.

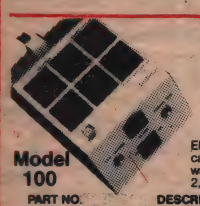
TRS-64K-2. . . . . $17.95
(Converts the Model IV from 16K to 64K or will expand the Model 4P from 64K to 128K)

TRS-64K2PAL (Model IV only). $38.95
(8 - 4164's with PAL Chip to expand from 64K to 128K)

TRS-80 COLOR AND COLOR II

Easy to install Kit comes complete with 8 each 4164N-20 (200ns) 64K Dynamic RAMs and documentation for conversion. Converts TRS-80 Color Computers with D, E, ET, F and NC circuit boards to 32K. Also converts TRS-80 Color Computer II to 64K. Flex DOS or OS-9 required to utilize full 64K RAM on all computers.

TRS-64K-2. . . . . $17.95



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DATASHIELD® Surge Protector

Eliminates voltage spikes and EMI-RFI noise before it can damage your equipment or cause data loss. 6-mo. warranty. Power dissipation (100 microseconds): 2,000,000 watts

PART NO.	DESCRIPTION	PRICE
MODEL 75	4 Sockets, On/Off Switch.	$49.95
MODEL 85	6 Sock., Super Filters, On/Off Switch.	$59.95
MODEL 100	6 Sock., Super Filters, Low Volt. Alarm.	$69.95
MODEL 110AMS	6 Sockets, Super Filters, Auto. Master Switch.	$99.95

DATASHIELD® Back-Up Power Source

Protect your computer from black-outs, brown-outs, power surges and line noise. PTI's PC200 is designed for PCs with floppy disk memory, the XT300 for hard disk memory and the AT800 for multi-user systems. A typical compatible PC for each of these standbys will be supported for 15 to 25 minutes after power is lost. Weight (PC200: 24 lbs.) – (XT300: 37.5 lbs.) – (AT500: 83 lbs.) – (AT800: 83 lbs.)

PC200	(200 Watt Rating).	$299.95
XT300	(300 Watt Rating).	$399.95
AT500	(500 Watt Rating).	$699.95
AT800	(800 Watt Rating).	$799.95

*** SUMMER SPECIALS ***

PROMETHEUS

Intelligent 300/1200 Baud Telephone Modem with Real Time Clock/Calendar

The ProModem™ is a Bell 212A (300/1200 baud) intelligent stand-alone modem • Full featured expandable modem • Standard features include Auto Answer and Auto Dial, Help Commands, Programmable Intelligent Dialing, Touch Tone™ and Pulse Dialing & More • Hayes command set compatible plus an additional extended command set • Shown w/alphanumeric display option.

Part No:	Description	Price
PM1200	RS-232 Stand Alone Unit.	$319.95
PM1200A	Apple II, II+ and *IIe* Internal Unit.	$299.95
PM1200B	IBM PC and Compatible Internal Unit.	$239.95
PM1200BS	IBM PC & Compatible Internal Unit w/Mite Software.	$274.95
MAC PAC	Macintosh Package. (Includes PM1200, Cable, and ProCom-M Software)	$369.95

OPTIONS FOR ProModem 1200

PM-COM	(ProCom Communication Software). Please specify Operating System.	$79.95
PM-OP	(Options Processor).	$79.95
PMO-16K	(Options Processor Memory – 16K).	$ 4.50
PMO-32K	(Options Processor Memory – 32K).	$ 9.00
PMO-64K	(Options Processor Memory – 64K).	$18.00
PM-ALP	(Alphanumeric Display).	$79.95
PM-Special	(Includes Options Processor, 64K Memory and Alphanumeric Display).	$169.95

KEYBOARDS

13⅛"L x 4¼"W x ¾"H

Mitsumi 54-Key Unencoded All-Purpose Keyboard

• SPST keyswitches • 20 pin ribbon cable connection • Low profile keys • Features: cursor controls, control, caps (lock), function, enter and shift keys • Color (keycaps): grey • Wt.: 1 lb. • Pinout included

KB54. . . . . $14.95

New!

82-Key ASCII Cherry Keyboard

• 7-bit parallel ASCII • 11-key numeric keypad • Cursor keypad • SPST mechanical keyswitches • 4 illuminated keys • 26-pin header connector Color: white • Size: 18"L x 6¼"W x 1¼"H • Spec included

KB8201. . . . *(1700 avail.)*. . . . $29.95

Apple Keyboard and Case for Apple II and II+

Keyboard: • 68 keys • 15-key keypad • Direct connection with 16-pin ribbon connector • 26 special functions • Size: 14½"L x 5½"W x 1½"H

Case: Accommodates KB-A68 • Pop-up lid for easy access • Fits power supply and motherboard too • Size: 15½"W x 18"D x 4¼"H

Part No.	Description	Price
KB-EA1	Apple Keyboard and Case (pictured above).	$134.95
KB-A68	68-Key Apple Keyboard only.	$ 79.95
EAEC-1	Expanded Apple Enclosure Case only.	$ 59.95

POWER SUPPLIES

Power/Mate Corp. REGULATED POWER SUPPLY

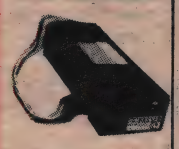
• Input: 105-125/210-250 VAC at 47-63 Hz • Line regulation: ±0.05% • Three mounting surfaces • Overvoltage protection • UL recognized • CSA certified

Part No.	Output	Size	Weight	Price
EMA5/6B	5V@3A/6V@2.5A	4⅞"L x 4"W x 2⅛"H	2 lbs.	$29.95
EMA5/6C	5V@6A/6V@5A	5⅝"L x 4⅞"W x 2⅞"H	4 lbs.	$39.95

KEPCO/TDK 4-OUTPUT SWITCHING POWER SUPPLY

• Ideal for disk drive needs of CRT terminals, microcomputers and video games • Input: 115/230VAC, 50/60Hz • Output: +5V @ 5 Amp, +12V @ 1.8 Amp, +12V @ 2 Amp, -12V @ 0.5 Amp • UL recognized • CSA certified • Size: 7⅜"L x 6-3/16"W x 1⅝"H • Weight: 2 lbs.

$59.95 each or MRM 174KF. . . . . 2 for $99.95



Switching Power Supply for APPLE II, II+ & *IIe*™

• Can drive four floppy disk drives and up to eight expansion cards • Short circuit and overload protection • Fits inside Apple computer • Fully regulated +5V @ 5A, +12V @ 1.5A, -5V @ .5A, -12V @ .5A • Direct plug-in power cord included • Size: 9⅞"L x 3½"W x 2¼"H • Weight: 2 lbs.

KHP4007 (SPS-109). $59.95

4-CHANNEL SWITCHING POWER SUPPLY

• Microprocessor, mini-computer, terminal, medical equipment and process control applications • Input: 90-130VAC, 47-440Hz • Output: +5VDC @ 5A, -5VDC @ 1 A; +12VDC @ 1A, -12VDC @ 1A • Line regulations: ±0.2% • Ripple: 30mV p-p • Load regulation: ±1% • Overcurrent protection • Adj: 5V main output ±10% • Size: 6⅜"L x 1⅞"W x 4-15/16"H • Weight: 1½ lbs.

FCS-604A. $69.95

New!

IBM PCXT EQUIVALENT 130 WATT POWER SUPPLY

UPGRADE YOUR PC!

• Input: 100V-130V/200V-260V selectable @ 47 to 63Hz • Output: +5VDC @ 15A, −5VDC @ 0.5A, +12VDC @ 4.2A, −12VDC @ 0.5A • Plug compatible connectors • Fits into IBM PC • Weight: 6 lbs.

IBM-PS. $159.95

$10 Minimum Order – U.S. Funds Only **CA Residents: Add 6½% Sales Tax** **Spec Sheets – 30¢ each**
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Apple Accessories

5¼" APPLE™ Direct Plug-In Compatible Disk Drive and Controller Card

The ADD-514 Disk Drive uses Shugart SA390 mechanics—143K formatted storage • 35 tracks • Compatible with Apple Controller & ACC-1 Controller • The drive comes complete with connector and cable – just plug into your disk controller card • Size: 6"L x 3½"W x 8-9/16"D • Weight: 4½ lbs.

ADD-514 (Disk Drive). $169.95
ACC-1 (Controller Card). . . . . $ 49.95

More Apple Compatible Add-Ons...

APF-1	(Cooling Fan with surge protection).	$39.95
KHP4007	(Switching Power Supply).	$59.95
JE614	(Numeric/Aux. Keypad for *IIe*).	$59.95
KB-A68	(Keyboard w/Keypad for II & II+).	$79.95
MON-12G	(12" Green Monitor w/swivel stand).	$99.95
JE864	(80 Col. +64K RAM for *IIe*).	$99.95
ADD-12	(5¼" Half-Height Disk Drive).	$169.95

NEW!

ADDITIONAL APPLE™ ADD-ONS AVAILABLE

ARC-16K	(16K RAM Card for Apple II & II+)	$39.95
AEB-2	(EPROM Burner for Apple II, II+ & *IIe*) Allows copy of standard EPROMS 2716, 2732, 2764	$69.95
A80-C	(80-Column Card w/Soft Switch).	$74.95
ADD-IIc	(5¼" Half-Ht. Disk Drive for Apple *IIc*)	$169.95

DISK DRIVES

Documentation Included *Best Buys!*

MPI51S	(MPI 5¼" SS full-ht.).	$ 89.95
RFD480	(Remex 5¼" DS full-ht.).	$109.95
TM100-2	(Tandon 5¼" DS full-ht.).	$159.95
FD55B	(Teac 5¼" DS half-ht.).	$149.95
SA455	(Shugart 5¼" DS half-ht.).	$159.95
FDD100-8	(Siemens 8" SS full-ht.).	$119.95
PCK-5	(5¼" Power Cable Kit).	$2.95
PCK-8	(8" Power Cable Kit).	$3.95

UV-EPROM Eraser

8 Chips - 21 Minutes

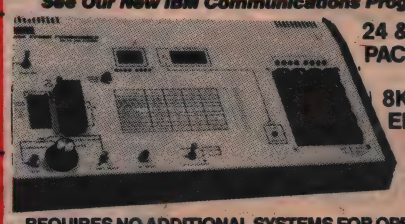
1 Chip - 15 Minutes

Erases all EPROMs. Erases up to 8 chips within 21 minutes (1 chip in 15 minutes). Maintains constant exposure distance of one inch. Special conductive foam liner eliminates static build-up. Built-in safety lock to prevent UV exposure. Compact – only 9.00"L x 3.70"W x 2.60"H. Complete with holding tray for 8 chips.

DE-4 UV-EPROM Eraser. $74.95
UVS-11EL Replacement Bulb. $16.95

JE664 EPROM PROGRAMMER

See Our New IBM Communications Program!



24 & 28 PIN PACKAGES

8K to 64K EPROMs

REQUIRES NO ADDITIONAL SYSTEMS FOR OPERATION

Programs and validates EPROMs • Checks for properly erased EPROMs • Emulates PROMs or EPROMs • Loads data in RAM by keyboard • Changes data in RAM by keyboard • Loads RAM from an EPROM • 664 RAMs can be used for external microprocessor development • Compares EPROMs for content differences • Copies EPROMs • Input: 115VAC @ 60Hz • Assembled and tested • Size: 15⅝"L x 8¾"D x 3½"H • Wt: 5¾ lbs • **2716 Module included**

JE664-A EPROM Programmer. $995.00

JE665-RS232C INTERFACE OPTION – This option implements computer access to the JE664's RAM, allowing computer to manipulate, store, and transfer EPROM data to and from the JE664. Sample program listing is supplied in MBASIC for CP/M computers • Documentation provided to adapt the software to other computers with an RS232 port • Specs: 9600 Baud, 8-bit word, odd parity with 2 stop bits • Assembled and tested • **2716 Module included**

JE664-ARS EPROM Programmer w/JE665 Option. $1195.00

JE664-ARS COMMUNICATION PROGRAM For IBM-PC or XT and Compatibles

• Fast compiled BASIC program • Easy to use, menu-driven • Print hard-copies of EPROM data • View data in HEX and ASCII **NEW!**

The JE664-ARS Communication Program was written for quick interfacing between the JE664-ARS EPROM Programmer and the IBM-PC computer and compatibles. Menu-driven program allows user to Load and Save EPROM data to and from the computer or floppy disk. Data entered by the computer can be viewed in Hex & ASCII formats. Printed hard-copies are also displayed in both formats. Program is ideal for keeping archives of master EPROMs on disk. The program is compatible for all EPROMs listed with the JE664. Computer requirements: IBM-PC, XT (or eq.) with at least 128K RAM and one serial port. Optional: One parallel port for printer.

JE664-ARS-CP. $49.95
JE664-ARS Communications Program (5¼" Disk and User's Instructions)

JE664-CP CABLE. $29.95
Cable for IBM-PC to JE664-ARS Program (5' Shielded Cable Assembly)

JUMPER (Personality) MODULES – Jumper (Personality) Modules for 8K, 16K, 32K, and 64K EPROMs. *Please specify EPROM and manufacturer.
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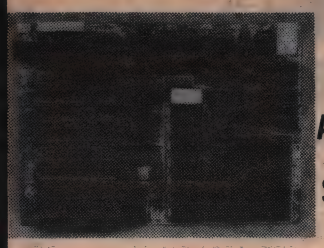

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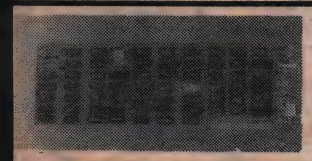

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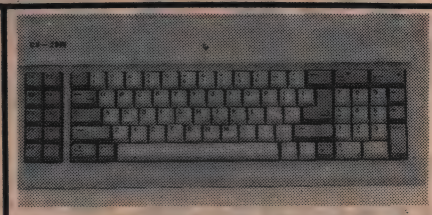

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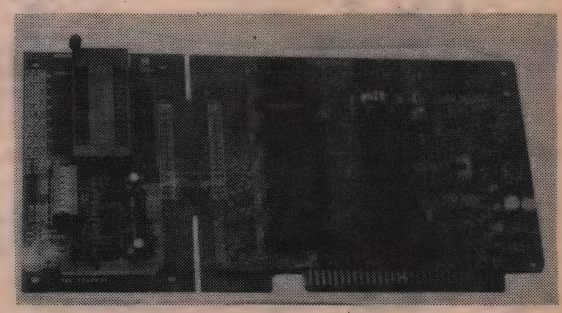

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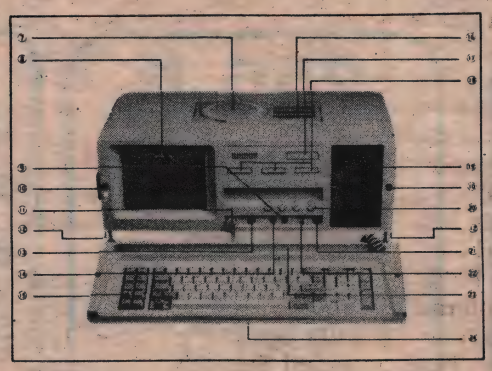

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Compaq's Deskpro — Once Again, Superior Quality

by Barbara E.
and John F. McMullen

The Compaq "Deskpro" is an impressive machine. It, like its earlier released sisters, the Compaq Portable and the Compaq Plus, is the most fully compatible computer to the IBM/MS-DOS standard on the market (it is, in fact, more compatible to the PC than IBM's own AT). Without rehashing all of the issues relating to compatibility, suffice it to say that the Compaq computers run all important business software (and over 95% of all software) designed for the IBM-PC right out of the manufacturer's package (there is no need to rename a "GWBasic" as "Basica" or to do any other type of mechanical gyration). Further, Compaq is committed to make every effort to assure full compatibility with all software and accessories designed for the PC and works constantly with software authors and peripheral providers (ex. AST, Quadram & Techmar) to insure this compatibility. This attention to the importance of compatibility has made Compaq the second largest (after IBM) provider of 8088/8086 based computers and, in its first year of production, the first company ever to reach $100,000,000 of sales in its initial year. Additionally, the engineering quality of the compatible product is such that a recent Yankee Group survey of personal computer managers in business organizations rated the Compaq Portable the most highly of all business computers, supplanting the IBM PC/XT which had previously had the highest rating (the rating was based on questions concerning hardware and operational features, support, compatibility and the respondents's subjective rating of a list of over twenty-five personal computers).

While all this adherence to compatibility with the IBM standard might be interesting to those of us who care about such things, there would be little reason for considering the purchase of one of the Compaq line if the model in question did not perform some functions considerably better than its IBM counterpart. The original Compaq Portable certainly fulfilled this requirement by providing a rugged, fully IBM-compatible portable computer when no other manufacturer had anything comparable (IBM eventually rushed its own portable into the field to attempt to cut into Compaq's domination of that market niche but the IBM model proved to be an inferior product in comparison to the Compaq portable). The Compaq Plus also fits this definition by providing hard disk capability in a rugged, well-built "transportable." The Deskpro continues the tradition of adding additional features while retaining true compatibility by adding increased speed, a chassis built for expansion into hard disks and a built-in method of backing up the hard disks (we will explore these features in depth as we proceed further into this review).

The name "Deskpro" actually represents a line of 8086-based computers ranging from a low-end Model 1 (containing 128K and a single 360K floppy disk drive) to a high-end Model 4 (containing 640K, a single 360K floppy disk drive, a 10Mb hard disk, a built in tape backup for the hard disk and an asynchronous communications/clock card). The Model 2 with 256K and 2 floppy drives is directly competitive with the PC while the Model 3 with 256K, 1 floppy drive and a 10Mb hard disk is PC/XT competitive. All models include Compaq's dual mode monitor and connections for a parallel printer, RGB color video monitor, composite video monitor and RF modulator. All models also have the same housing (14.74" wide by 13.75" deep by 10.75" high) which contains internal space and sockets for the maximum configuration. This design feature, coupled with the use of the same 200-watt power supply in all units, gives purchasers the ability to expand any model to the maximum configuration.

The use of the 8086 chip with a 7.14MHz clock (vs the supposed 6.144MHz clock of the 80286-based IBM-PC AT) is a major reason for the increased speed (over twice that of the PC). Another factor is the use of 256K memory chips which allow all 640K of addressable memory to be put on the "motherboard." This feature eliminates having to choose either the degradation of using an 8-bit bus (as in the PC & PC/XT) to access additional memory or forsaking compatibility with existing peripheral cards by using a 16-bit bus (as in the PC AT).

The concern for compatibility is shown further by Compaq's use of two different clock speeds in the units. The aforementioned 7.14MHz clock runs the computer at maximum 8086 speed and is utilized for most applications. A 4.77MHz clock rate (the same as the PC & PC/XT) may be utilized when either the software in use is dependent on internal clock rate (ex. communications software which contain "time-out loops" in attempting to connect to external lines) or when the additional speed is inappropriate (ex. games such as "PacMan" where the user would not want the figures to run around the screen at twice the speed). Switching between the lower (which Compaq calls "common") and higher speed may be accomplished either under

Compaq Deskpro Computer

Continued on page 64

Smartcom II And The 2400 Baud Modem

by Andrew Fried

I'm sure every one has seen the Federal Express commercial featuring the man that speaks ten times faster than his human counterparts. While his zest for the spoken word surely places him as the fastest speaker of the English word, one might wonder the significance of that achievement in light of the fact that no one can understand what in the world he's saying. This is analgous to the present state of 2400 baud modems which are supported by few information networks at present.

With that scenario in mind, I want to introduce the Hayes 2400 baud modem and the revised Smartcom II Version 2.1 package recently released by Hayes Microcomputer Products. Remember that when Hayes introduced 1200 baud modems to the personal computer world, few services supported them.

Hayes certainly needs no introduction in the world of modems; they have set the standard by which all others are judged in much the same way as IBM set the standard for the MS-DOS world. In order to compete in todays market, software compatibility or emulation of a Hayes is a must for any modem manufacturer. Unfortunately, Hayes decided to stray somewhat from the very standard it had created.

No Dip Switches

While the Hayes 2400 baud modem is physically identical to its 300 and 300/1200 baud counterparts, several very important differences set them apart. The major difference (besides the speed) that sets the two modems apart is the lack of dip switches on the 2400 baud version.

The original Hayes modems (300, 1200 baud) have dip switches mounted behind the front panel. These switches are used to configure the modems so that on power-up, the modems parameters are set without the need for software control. While all of the dip switch settings can be overridden by software, not all software programs take advantage of this and assume the modem to be configured in a certain manner.

The Hayes 2400 does just the opposite. All of the various parameters needed to configure the modem must now be done thru software. While the new release of Smartcom II supports all of the features of the 2400 baud modems, other programs such as PC-TALK will not. Even Sidekick was unsuccessful in operation with the 2400 baud modem. While the operating commands between the 300/1200 series and the new 2400 remain the same, few other programs initialize the modem using the modem control codes. Don't expect other Hayes compatible software to be compatible with the 2400. In other words, if the 2400 baud modem becomes a standard Hayes will have eliminated "Hayes Compatible" competitors.

In my opinion, this presents the most serious drawback to the modem; software presently believed to be "Hayes compatible," may or may *not* work depending on whether or not it issues the necessary software commands. If you have ever had a modem **not** Hayes compatible, you already understand the problem.

For example, even the volume control of the speaker is now adjusted under software control. No longer can you

Continued on page 63

New Power-base™ Runs Under IBM's TopView™

PowerBase Systems, Inc., the New York City based developer and publisher of personal computer software, believes IBM Corp.'s new product, TopView™, is part of the "long view" of market viability. So much so that the enhanced version of Power-base™, Release 2.1, is compatible with TopView.

TopView is a single-user multitasking, windowing environment for the IBM PC, XT and AT. The new version of Power-base, 2.1, released April 15, 1985, runs under TopView, either as a stand alone program or, in the "background," as a concurrent process. This compatibility was developed and tested by PowerBase's product development staff using a pre-release copy of TopView.

Through the TopView Window command, the user can "size" and "move" the assigned Power-base window. In other words, the user specifies the actual position of the Power-base window and how much of the corresponding Power-base screen will be visible on the TopView screen. The user can always "move" the window to another location on the TopView screen. For instance, suppose the user is outloading data from Power-base to a Lotus spreadsheet file, using Power-Base's PowerLinks™ feature. The only portion of the Power-base screen worth showing during the data transfer would be the counter monitoring the process, record-by-record.

The user can take advantage of TopView's ability to "hide" Power-base even when the letter is in active use. For example, there are certain Power-base tasks that are not of visual interest to the user (i.e., complicated searches or batch record purges from a large file). The Power-base job can be executed in the background, without the process displayed on-screen, while the user works with another application. PowerBase President, Iain Macfarlane explained why Power-base is among the first software programs to run under TopView.

"From the beginning, we've held to the belief that a database management system should be the 'control center' — the 'heart', if you will — of a computer system," said Macfarlane. "We achieved this with the introduction of PowerLinks™ in Version 2.0 (released September 1984). TopView compatibility is the logical extension of this innovative approach to integration. We jumped on the TopView bandwagon as soon as we could!"

Macfarlane said the applications of Power-base under TopView are "wonderfully practical." If the user is conducting a lengthy search or sort in Power-base, he or she can "switch" to another program and leave Power-base running smoothly in the background. Or during this same process, the user can go into DOS Services and examine a Power-base INLOAD Error/Reason file.

There are a few limitations of what can be done with Power-base under TopView. For instance, it is not possible to use TopView's "cut and paste" feature with Power-base. This involves copying and removing data from an application to be added into another. But, as Macfarlane notes, PowerLinks handles most desired data exchanges with other popular programs (Lotus 1-2-3, Symphony, Visicalc, Multimate, Chart-Master, Multiplan, etc.) and ASCII files.

For further information contact PowerBase Systems, Inc., 12 West 37th Street, New York, New York 10018. (212) 947-3590.

Mention that you read about it in the Computer Shopper. ●

Public Domain Software

by Bill Chin

While the 10th annual Trenton Computer Festival (TCF) for 1985 was ongoing thru March and operated at Trenton State College on the weekend of April 20, 21st. Both the ACG-NJ and NYACC clubs would have NO new releases for the Public Domain sector of Microcomputing. Usually at this time the TCF would be the main focus of these clubs in the NYC Metropolitan areas. They will resume releases from the Sig/M Users Group library for CP/M--80, CP/M-86, CCP/M-86, MP/M-80, MP/M-86 oriented software.

The Sig/M Users Group library still is impressive at 223 volumes of interchangable system utilities thru applications software (each volume is 241kb stored on 8 inch SSSD diskettes). The CPMUG library has been dormant now for a few years in respect to releases into the public domain areas.

The PC-Blue library is also in temporary hold at 110 volumes of software for IBM and their 'clones' who use PC-DOS or MS-DOS operating systems (software is on 5.25 inch diskettes storing 320kb DSDD diskettes). There will be many new releases next month for public consumption...stay tuned on your local modems.

The Capital PC Users Group now has quite a few revisions as well as new releases now through 036. Please note there is now a new Software Chairman — Mel Cooperman now replacing Rich Schinnell who now moves on as VP of CPCUG (be on the lookout for a new BBS software system... <disc...>).

Here's the revised information as of April, 1985:

CPCUG Bulletin Boards:

Capital PC Messages: Wes Merchant D) 703-560-0979 24 hrs.

Monitor article upload: Doug Thompson H) 301-424-5817.

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           Last Release:   3-17-85

           Ver CPC-12.2D  1 disk
           compiled and source
           code      .....  8-24-84
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Continued on page 62

PC-WRITER — Achieve True PC Compatibility On The Oki 82a Printer

by Tom Szlucha

This is a review of a new printer enhancement called "PC-WRITER." This product is designed to modify an Okidata 82a (or 83) printer to achieve compatibility with the IBM PC. Before describing the main features of this product, I'd like to digress briefly to discuss the potential value of such a device.

Compatibility was an easily understood word until computers came along. Now we scratch our heads as we read statements like "95% PC compatible" in product literature. What is that supposed to mean? Does it mean that the software runs fine if you do not mind green text on a purple background? Or perhaps it means that you only need to change 5% of each program to get it to work properly with the computer. I'm being somewhat facetious to make a point. Understanding compatibility and how it is applied to a computing system is very critical to performance. This is particularly true in the potentially "Tower of Babel" business of trying to get a computer from manufacturer A to work properly with a peripheral from manufacturer B.

My experience climbing this "Tower of Babel" began when Santa brought an IBM PCjr this past Christmas. I have had an Okidata 82a for several years. This printer, not in any way worn, would make a perfect companion for my low cost excursion into the world of MS-DOS. No problem, after all, I had previously connected

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First GEM Applications Bring Graphic Interface To IBM PC

Digital Research Inc. introduced its first end-user application programs that take full advantage of the Graphics Environment Manager (GEM) operating system extension — GEM Desktop and GEM Draw. The company also announced two new GEM software applications — GEM Paint and GEM Write — which will be bundled as the GEM Collection with GEM Desktop.

GEM Desktop and GEM Draw bring to the entire line of IBM Personal computers and compatibles drop-down menus, windows, icons and support for a mouse pointing device, ideas pioneered on the Xerox Star and popularized on the Apple Lisa and Macintosh. Other GEM-based programs will be announced by Digital Research in the third and fourth quarters of 1985.

"Now that applications with the GEM user interface are available, those who do not want to learn the complicated commands that typify the majority of IBM PC applications will be able to use personal computers," said John Rowley, president of Digital Research. "With these applications, we are beginning to open up the personal computing world to all of business America."

GEM Desktop

GEM Desktop elimintaes the need to learn complex operating system commands by replacing them with a visual and intuitive interface. On machines equipped with GEM and GEM Desktop, a graphical representation of a desktop equipped with disks, a waste basket and folders appears. Simply by moving the mouse and clicking the mouse button or by making simple keystrokes, the user can open a file, run a software program, delete a file or do anything else possible under the operating system.

Up to six GEM Desktop accessories, such as a calculator or a clock, can run with other

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APPLE II

Ask The Guru

by Don Lancaster

That deadly IIe "enhancement" trap, getting started in ET watching, a replacement for **Softalk**, an **Applewriter** triple header, laser printer info, and a great directory.

Gee Toto. I don't think we are in Kansas anymore.

My are there ever a lot of you out there. The helpline phone has literally been ringing off the hook. And mostly with intelligent and well thought out questions. And, amazingly, some of them are even solvable one way or another.

As a reminder, I am somewhat of an Apple freak and an assembly language person, so the further you stray from the way, the truth, and the light, the fewer and the mangier the rabbits I can pull out of the hat. To join in the fun, write or call per the box at the end. Calling is better than writing and best calling times are 8-5 Mountain Standard time.

Two big pieces of news this month. The first is that my **Enhancing your Apple II**, volume II is finally in print, and is now available from B. Dalton, the SAMS 1-800-428-SAMS hotline, or from any of the usual places.

Our second news item is super important...

What is the real word on The Apple IIe upgrade

First off, it is **not** an upgrade. It is a lateral arabesque. If you have had your IIe for a while and if you have lots of favorite software, the "upgrade" is really a deadly trap that may cause you no end of grief.

For you see, when you haul your IIe and $70 off to your friendly local Apple dealer, he will steal your existing monitor and character generator ROMs and refuse to give them back to you. This will prevent you from ever again running stock copies of most of your favorite existing software, including Visicalc and Applewriter IIe, among countless others.

Figure one sums up this warning.

Apple's claim of "95 percent compatibility" includes some very carefully chosen weasel words. If you read between the lines on the fine print, this 95% compatibility only exists if you buy all brand new software, and then use only the newest and latest version of each and every available software package.

The 95% compatibility figure is what the Houyhnhnms would politely term "that which is not so."

In reality, if you have lots of older software around, the compatibility is something under 15% and is falling fast. Particularly if you measure software compatibility in terms of actual use hours. In general, if the software uses inverse text or a software flashing cursor, the display will end up trashed after the upgrade.

While most older and existing software can be repaired with simple patches, doing so on a locked and protected program from a non-cooperative or bankrupt software vendor ceases to be a joy real quick like. Especially if you are in the middle of something when you try the upgrade.

Things get really nasty if you have several hundred programs on hand that will not run properly.

Now, from Apple's point of view, and from the point of view of a brand new Apple owner, the upgrade is a very good thing. The upgrade makes the IIe and the IIc much more similar, so that identical or nearly identical new software can be run on both machines. The new monitor chips accept lower case Applesloth and monitor commands, scroll better, include a mini-assembler, provide new search and ASCII monitor commands, and support full interrupt management. The mini-assembler is not all that great. **Bugbyter** is far better.

The upgrade includes a new 65C02 microprocessor. This dude runs cooler and provides a handful of new instructions. All of which are interesting and useful additions, but none of which are earth-shattering. Any attempt to use these new instructions automatically excludes the software from running on a II or II+, since many of these 65C02 instructions can actually hang an older 6502.

While hand-crafted code that uses these new instructions can end up 10% shorter and 10% faster, no speed or length difference will automatically happen with existing code.

By the way, if you only want a 65C02, you can get one free. Which is $70 cheaper than the Apple upgrade. But please, do not tell **Rockwell** who told you to write them on your business letterhead for a free 65C02.

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Figure one . . .

WARNING!

The Apple IIe upgrade is really a lateral arabesque. Your dealer will steal your old ROMs, preventing you from ever again running stock and favorite older programs such as Visicalc or Applewriter IIe, among countless others.

Be ABSOLUTELY CERTAIN you make EPROM firmware backup copies of the CD monitor ROM (2764), EF monitor ROM (2764), and, above all, the F4 video ROM (2732), before even remotely considering an upgrade.

Show Report, Softcon And West Coast Computer Faire

By Computer Shopper Staff

The Spring is here, come to the Faire! This is the theme of all the computer shows that are scheduled all over the land and Computer Shopper will attend many of them both as an exhibitor and as reporters of the events and introductions that are made on these occasions.

The first shows we attended for the spring season were held in opposite parts of the U.S. The 10th West Coast Computer Faire was at San Francisco's Moscone Center for the first time while Softcon was held in the Georgia World Congress Center in Atlanta Ga. Both shows were held during the first days of April, 1985 but were aimed at different types of attendees.

The West Coast Computer Faire was founded by Jim Warren and has always been one of the great "Gatherings of The Computer Clan" where computerists from all over the world gathered to see, listen and talk to each other. After eight faires, Jim sold out to Prentice-Hall who conducted their first show last year at Brooks Hall. That show seemed to have lost its flavor as the place where the small companies and start-ups could first show their wares. Perhaps it was because Brooks Hall was becoming too small for the show. This year in the much larger setting of Moscone Center, the old spirit returned to the WCCF and the show was much like the ones of old. The featured speakers were Gary Kildall of Digital Research author of CP/M, Gordon Eubanks author of CBASIC, Lee Felsenstein designer of the SOL and Osborne computers, Adam Osborne and Jim Warren. The program of seminars covered subjects that seemed to be of great interest judging by the crowds that attended and the reception given the speakers. Most of the major computer manufacturers had booths but nothing new was introduced, instead the hardware makers were trying to gain software support for their products as much as luring the end users. The selling merchants offered their usual bargains and did a brisk business at the show. Prentice-Hall seems to have learned how to run this show and restored the real "Faire" atmosphere that Jim Warren created over the years.

Softcon in Atlanta was quite a different show, being mainly a showcase for end user software systems. Being held in the huge World Congress Center in Atlanta it was small for that hall and seemed sparsely attended. The first Softcon held in New Orleans last year attracted most of the software industry but in this second show, none of the large software publishers attended. Perhaps it was too close to Comdex which will be held in the same hall in May. There are too many computer shows and companies can not attend them all. The timing of Softcon was very bad and this had an affect on both attendees and exhibitors. While none of the really big software houses were at the show, there were many new software companies showing interesting software systems. There were many vertical packages for all kinds of businesses from dress stores to auto body shops. Integrated packages for MSDOS were also plentiful. One thing about a show with small attendance, the people who do come can really look at everything and get a chance to sit down and use the software demos. At this show the exhibitors really reached out and pulled the attendees into the booth every chance they got. It was a great show to attend because you really got a chance to see something and learn something. The seminars were also not very well attended but those we went to were good and on interesting subjects. We believe that there is a place for a show like Softcon but hope that next time it is run at a better time.

Our next report will be from Comdex in Atlanta and the Dayton Hamvention another well known Clan Gathering. ●

Short Circuit

by Steve Robinson

ZAP! Quickly I jumped across to the next circuit wire. My single-minded goal was to capture that spark without getting hit by neutrons. I reached the spark and immediately felt the 100 millivolt surge. Moving hurriedly towards the nearest battery to transfer my newly acquired energy, I could see the microfuse was closing fast. I had to reach the next battery before it made contact. I jumped across to another circuit wire, narrowly missing a neutron hit. The battery I had as my next target was only two wires away but the deadly neutrons in-between assured me this wouldn't be an easy mission. Without hesitation I made the last jump to the circuit wire. ZAP! I was hit by a neutron; a 300 millivolt drain. It couldn't have come at a worse time. The microfuse was only microseconds to contact. I had to reach it in time and reverse the polarity. Jumping the circuit wires took a little practice, but by now I had it down pat. I reached the microfuse just as it was about to send the detonation pulse and reversed the polarity. I had gained myself some time... for the moment. I still had to overload those batteries and disarm this circuit. I reached the first battery and transferred the 450 millivolts to the other batteries in the circuit. The second battery was now charged at over 800 millivolts. One more to go. When I reached it, the transferred power put the last battery into OVERLOAD. My last task was to reach that battery and disarm the microchip. Hopping circuit wires and avoiding neutrons was now a familiar routine. I made it to the overloaded battery in record time. The circuit was disarmed! The circuit blown, I had now reversed the roles of the neutrons and myself. I now had the power to destroy them. ZAP! 1000 points racked up. ZAP! ZAP! 5000 points from a double neutron and myself. I chased neutrons throughout the circuit increasing my score as I went. The more points I received, the faster the neutrons moved. Nothing stood in my way. Then the vacuum hit me when I wasn't looking. The Lightning Run was over. But I had disarmed one microcircuit; eleven more to go.

Despite a rather depressing theme, Short Circuit has become one of my favorite games. Read the first paragraph out of the instruc-

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AIM Revives Apple III

The Association of Independent Microdealers (AIM), a group of dedicated professional independent computer dealers, announces the **"Apple III Is For Me"** program. It is the intention of the association to smooth out any ill feelings among association members and Apple III owners. Since the livelyhood of the independent computer dealer depends directly upon the relationship he establishes with his local customers, it is necessary that these customers respect his judgement and rely upon his expertise. The reputation established by a local independent can be marred by one unhappy customer.

Independent computer dealers have, over the past few years, put their personal reputations on the line when selling the Apple III computer. For many of these dealers the Apple III was the only real business system they had to sell at that period and not only did they believe in the product, but they enthusiastically supported and promoted it. Since Apple computer has decided to phase out the Apple III, many Apple computer customers have felt let down and disturbed about their decision to purchase an Apple III from the local independent. Today, because of the dry up of resources and hardware and software support, the independent finds himself fighting to keep his customers content.

In addition to the customer ill feelings, the independent also finds himself with an excessive amount of Apple III products on the shelf. The "Apple III Is For Me" program will provide a means for AIM

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Apple IIc Printer Interfacing

Part II

by Fred Blechman

Table 3 presents data on interfacing Apple IIc with four popular serial printers and five interfaces. To make a decision you should compare any serial printer you are considering with the Apple Imagewriter a scribe printer. ●

Table 3 - Apple IIc Printer Interfaces Comparison Chart

Name & Source	Price ($)	Size (inches)	Box	Power Supply	IIc Cable Cable	Power LED	7-Bit 8-Bit?	Baud Select?	Ribbon or Cable (cent)	Star Micronics Gemini 10x Notes: 1 & 2	Everett/ Charles CP-80	Star Micronics Powertype note: 3&4	Star Micronics STX-80 Note 5	Remarks
Model 770-2C Serial/Parallel Converter. TigerTronics Inc. 2734-C Johnson Dr.. Ventura, CA 93006 (805) 658-7466	99.95	4x3x1½	Plastic Light Brown/ Dk. Brown	$10 extra (if reqd) directly wired	incl. directly wired.	No	Yes (inside)	Yes (inside)	Ribbon	Text: normal Graphics: normal	Text: normal	Text: normal	Text: normal	Baud rate and word format internally set with jumpers. Needs no settings as received, best documentation
SPC-2 Serial To Parallel Converter. Technologic Systems P.O. Box 44, Raymond, OH 43067 (614) 890-6960	79.95 + 2.00 S&H	5x4x1½	Plastic White/ Gray	Incl. directly wired	$8.95 plugs in.	Yes	Yes	Yes (inside)	Ribbon	Text: normal in 7-bit mode. Graphics: normal in 7 or 8-bit mode	Text: normal in 7-bit mode. Graphics: normal in 7 or 8-bit mode	Text: normal in 7-bit mode	Text: normal in 8-bit mode	External 7/8 bit switch, baud rate selectable internally with switch
B1001 "The Hamlet" Apple IIc Printer Interface. Belkin Components 4718 W. Rosecrans Ave., Hawthorne, CA 90250 (213) 644-3184	98.50	4x3½x1	Metal Black	incl. plugs in. note 6	incl. plugs in.	No	No	No	Cable	Text: normal Graphics: normal	does not work	Text: normal	Text: normal	Normally used without external power, nothing to adjust easiest to use
SPC-1 - IIc Parallel Printer Interface. Processor Hardware 8016 Remmet Ave. Canoga Park, CA 91304 (818) 340-8097	89.95	5x4x1½	Plastic White/ Gray	incl. plugs in.	incl. directly wired	Yes	No	No	Cable	Text: normal if printer switch in 7-bit mode (sw 2-3 on) Graphics: normal (sw 2-4 on)	does not work	does not work	Text: normal	Including "ready" LED to show printer on
SP-3 Apple IIc Interface CNR Engineering P.O. Box 492, Piscataway, NJ 08854 (201) 752-0144	74.95 + 2.00 S&H	5¼x3x2	Metal Aluminum	$5 extra if reqd. directly wired	incl. directly wired	Yes	Yes	Yes	Cable	Text: normal with adapter in 7-bit mode. Graphics: normal in 7 or 8-bit mode.	does not work	Text: normal with adapter in 7-bit mode	does not work	Switches external, with knobs, female extension connector for additional modem or printer

MACINTOSH

MacUniverse

by L.J. Kutten

Here ye, here ye. Do you want an original, photocopied digitized picture of your friendly neighborhood Universe Master? If you cannot wait, send a self-addressed, stamped envelope (22¢ postage please) to "Universe Master Offer," **Computer Shopper**, P.O. Box F, Titusville, FL, 32781, and an agent of the United States Government will personally deliver one to you. This is a limited time offer, so hurry.

Recently your Universe Master had the scare of a lifetime. I was afraid that my second disk drive, whose warranty had just expired, needed some expensive repairs. All of a sudden it would not read diskettes. It said they needed to be initialized. After searching the deepest recesses of my mind, I remembered I had the same problem with my Radio Shack Model I. The cure with it was to unplug everything and reconnect them. Figuring it could not hurt to give it a try, I did the same on the Mac. Lo and behold everything worked. So if you ever have similar problems with your Mac, try it. That worst that could happen is that your Mac still needs to be repaired. The best that can happen is that you have saved yourself an expensive service call.

Recently I have noticed a number of individuals offering non-Apple memory upgrades for a 128K Mac. For example, my local price is $250 (as compared to Apple's "official" price of $700). Besides the upgrade I will get a switch installed which will allow me to switch between having 128K and 512K available (useful for testing software). After due consideration, I decided to pay Apple's high price. The reason is simple: your universe master has been in computers long enough to realize that sooner or later a computer will need repairs.

While saving $450 appeals to all of us, I know that the inexpensive route can actually cost more money in the long run. For example, assume your Mac needs repairs. If you have Apple's upgrade, your repair service will just swap the damaged board for a small fix fee. But, if your board has been modified, it cannot be swapped and either your friendly local service technician will work on it at an hourly rate or you will have to buy a new board. A few repairs at $40 an hour can quickly eat up any savings.

If you do have a third party do the upgrade, be sure to: (1) check out the installer's qualifications; (2) make sure he/she has previously done the modification on someone else's computer (never be the first person); and (3) get a warranty in writing.

I have received two letters that deserve answering. First, Glenn King wonders if he made a mistake buying a Mac XL. He states that a lot of the software he buys will not work on it or cannot be transferred to its hard drive. Sorry Glenn, but I feel you did make a mistake. Do not let anybody con you; the Mac XL is not a Macintosh, it is merely a modified LISA. Apple will soon have an internal hard drive for the Mac (rumor is that will be the HyperDrive).

If you are one of those unfortunate souls who have an XL, look for a new version of MacWorks by June. This version should lessen the amount of disk swapping. As to the problem of putting a program on a hard disk, I have yet to find any program that cannot successfully be installed on one. It may be difficult, but it can be done. Join a local users' group or join MAUG on Compu Serve. In either place you are sure to find a Mac guru that can help you.

Secondly, Robert Studer took me to task about my column last March when I complained about MacWrite's limited capabilities on a 128K Mac. While Robert agrees that the program is not very good with 128K, he feels it is fine with a 512K Mac and two disk drives. Sorry Rob I have seen MacWrite in that configuration and I am still not impressed. MacWrite, version 2.2, is outrageously slow when the buffer is full. It is still just a memo writing program. If anybody wants serious word processing on your Mac (regardless of memory size) get Microsoft Word.

If you do not like Apple's Finder take a look at Fast Finder by Tardis Software. This program replaces the standard Finder. It offers a standard Macintosh display with a series of pull down menus, except that instead of being icon oriented it is text oriented. It runs much faster than the regular finder (Tardis claims five times and I believe it) and can handle up to 12 online volumes at once (especially useful if you have a hard drive). Other features include being able to (1) eject disks automatically, (2) list text files to the printer from the finder, (3) erase and rename disk, (4) search, scan, count lines, and combine text files, and (5) display directory and disk information without leaving the desktop. In many ways it reminds me of using the CP/M and TRSDOS operating systems. If you are familiar with them, Fast Finder gives you their power in a Mac environment.

Recently I went on vacation to Hawaii. While there I checked out the local Mac scene and was shocked to discover that a local users' group has distributed a disk of public domain BASIC language programs that also contained MicroSoft BASIC version 1.0. The user I talked to claimed it was on the disk when she got it. Well there is no way MicroSoft BASIC is a public domain program. Anybody passing it out is guilty of software piracy. The punishment for such piracy can include a $50,000 fine and a nice vacation at Federal jail.

Recently I received a Mouse Glide from Magnum Rubber Co. This is a rubber pad to be used under the Mac's mouse. The company claims that pick-up drag is reduced and table drag is eliminated. It really works. Now that I have it, I wonder how I survived without it. Best of all, it is inexpensive, it is only $6.95.

A local dealer wanted to loan me a copy of Continental Software's program "The Home Accountant and Financial Planner for the Macintosh" to review. After reading the manual, I decided not to. Normally I will review anything and call it like I see it, but in this case Continental Software has done something I feel is so dumb that no matter how good the program is, I would have negative feelings about it. The

manual has the following warning: "**WARNING Certain keys may have unpredictable results when used with The Home Accountant for the Macintosh. Please do not use these keys during the operation of the program: accent grave "`", the tilde "~", the up arrow key ...; or any other option key combinations.**" This is ridiculous. Why didn't they just write a keyboard filter. I could almost forgive the accent grave, the tilde, or up arrow (even though I cannot find the up arrow key on my keyboard) but the option key combination goes beyond the realm of acceptability. It is right below the shift key and too many people (including yours truly) will hit it while typing. If Continental ever releases a version without this "limitation" I will gladly review it with an open mind.

I recently received a book, **Mac Power: Using Macintosh Software** by Allen Munro. After reading it, I could not figure out why it was published. Primarily, all it provides is an overview of the major software available for the Macintosh that was available at the time the book was written. Among the programs covered are MacPaint, MacWrite, Multiplan, Chart, ThinkTank, Filevision, and Macintosh Pascal. Each is covered in a few pages that attempts to explain the how and why of each program. This book does have it uses; I would recommend it to a person who does not belong to a user group. To the person who does belong to a user group, you will learn more about a program by talking to a current user than reading this book.

Another book that wandered in is **The Macintosh BASIC Handbook** by Thomas Blackadar and Jonathan Kamin. This book is massive (over two inches thick) and is structured as an A-to-Z encyclopedia of Macintosh BASIC. It appears to contain everything that you could possibly want to know about Macintosh BASIC. I say "appears" because Macintosh BASIC has not yet been released. It always amazes me that some books describing software get published before the software gets released. Furthermore even if Macintosh BASIC is released (and I am not convinced it will be), do not buy the first edition of this book. At best it will only be 95 percent accurate. The problem is that the book was written based upon teh specifications provided by Apple but those specifications have changed. Already a second edition of the book is planned. You can tell which edition the book is by looking at the copyright page (usually behind the title page). If it does not say second edition, you have the first edition.

By now you should know that Lotus Jazz program has been delayed. According to my sources the delay is caused by a number of hard to remove bugs. Look for the program to be released in the middle of June.

A new version of MacWrite has appeared. It is Version 4.0. This is not the final version. My sources say it was released

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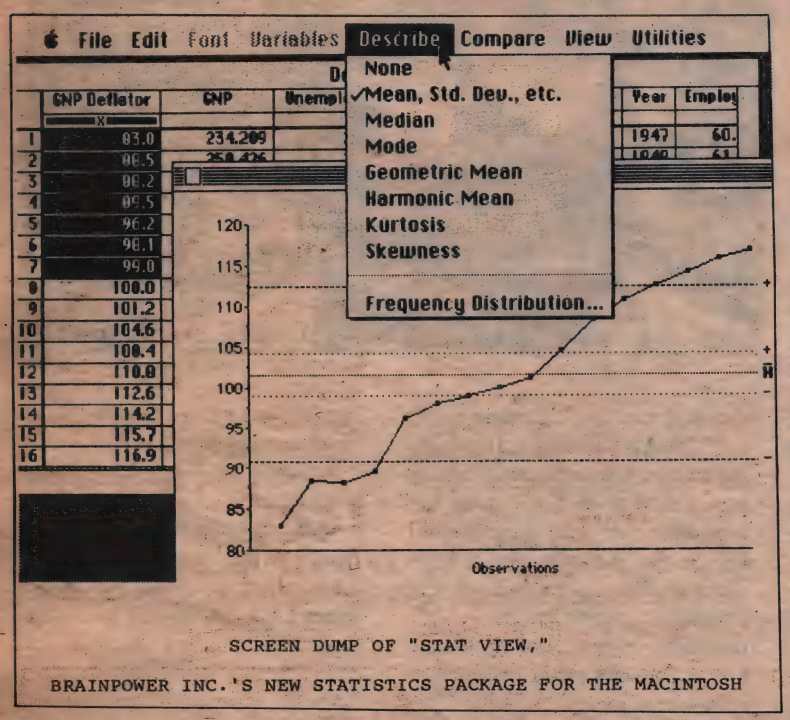
First Interactive Statistics Package For The Macintosh

Brainpower, Inc. has announced "StatView," which it claims is the most advanced statistics software ever designed for a microcomputer. It also is the first interactive statistics program for the Macintosh computer.

StatView is a technical utility designed for data analysis by people who work with numbers: economists, scientists, students, accountants, actuaries, sociologists, researchers, marketing executives, securities analysts, legislators, political campaign managers, the military, and all professionals who analyze data. It is a visual data-analysis package which takes advantage of the Macintosh computer's windows, pull-down menus, and mouse.

"StatView's powerful Mac features let users view and explore data in various ways to decide the most useful way to present an analysis," said Sherwin A. Steffin, president of Brainpower. "StatView's ability to create graphic displays is not equalled in any other statistics package."

Steffin called StatView a "break-through product" that employs the full capabilities of the Macintosh to give statistics users real-time access to data analysis in a variety of visual forms.



SCREEN DUMP OF "STAT VIEW,"
BRAINPOWER INC.'S NEW STATISTICS PACKAGE FOR THE MACINTOSH

How StatView Works

Most statistics packages do not permit simultaneous viewing and analysis of data. However, while keeping data in front of the user, StatView permits use of the mouse to select data for analysis and to choose type of analysis from a pull-down menu. Results appear in another window, changing as changes are made in the data. A variety of graphic representations of data or results are immediately available in a window alongside data on the screen. These include tables or bar, line, and pie charts, and scattergrams.

StatView is designed for use on all Macintosh formats including 128K and 512K Macintoshes and the 1-Megabyte LISA equipped with Mac Works, the Macintosh emulation disk. StatView permits window scrolling, changes in column width, and choice of font and font size for data in a window — small for viewing many columns and rows, or for ease of reading. Cut, copy, or past operations can be done between applications.

Types of Statistics Possible

Many types of statistical evaluation are possible with StatView including descriptive statistics, comparative statistics, and non-parametric tests. StatView's descriptive capability includes harmonic and geometric mean, standard deviation, standard error, variance, median, mode, frequency distribution, and coefficient of kurtosis and skewness.

Comparative statistics include paired and unpaired t-tests, Spearman rank-order correlation coefficient, ANOVA (Analysis of Variants) with percent variation explained, and multiple/simple multiple/and polynomial regression. Non-parametric tests include chi-square, Wilcoxon signed rank, Kruskal-Wallis, Friedman, Kolmogorov Smirnov, Mann-Whitney-U, and Wald-Wolfowitz runs.

Regular analysis includes the ability to plot the fitted line. Residuals, standardized residuals, and predicted value may be saved. Regular output includes coefficient table, ANOVA table, and residual analysis. All calculations are done with 80-bit precision using IEEE floating-point standard.

Graphic Representation

StatView permits complete flexibility in viewing or representing data including tabular text or a choice of scattergram, bar, pie, and line charts. The user can easily experiment with different types of representation to see which format gives the most useful view of results.

To find another statistics program in any way comparable to StatView, a user would have to look to IBM's SPSS (Statistics Program For The Social Sciences) which sells for $795.00 and must be used with the costly IBM-XT.

By contrast, StatView costs under $200.00. Its authors claim that StatView will perform comparably to SPSS, and

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Stan Veit's History The Digital Group of Denver

Back in the ancient days (1976) when all the computer world was on the S-100 or SS-50 Bus, a group of computer hobbyists rode on a different vehicle. These people known as the digital group (with small "d" and small "g" for some reason known only to themselves) marched to the drum of their own Guru, Dr. Robert Suding, who had some interesting and original ideas about personal computer systems. The digital group was composed of hobbyists who wanted to experiment with all possible microprocessors, their Bus was not completely connected. You completed the connections according to the CPU board you selected. The selection included 8080A 6800, 6500 CPUs and later digital group came out with the very first Z80 CPU board. The Bus had the equivalent of 200 lines to select from and it allowed the user to change the system architecture by merely changing the CPU card, and reading in a new operating system. All CPU dependencies were handled on the CPU card, nothing else in the system changed. When the new Z80 card came out, digital group owners could upgrade for a mere $185.

The digital group system had some other unusual characteristics. It was self-contained and required no front panel switch loading, or video display terminal. The video display was built into the system. You connected a keyboard and video monitor (or TV) and turned on the system. You were in the system monitor ready to load your program, or high level language. Now for the most interesting part. While the rest of the personal computer world was trying to load and save software on audio cassettes, digital group system owners used a high speed, remote software-controlled, digital cassette system with a true file system. The tape units, called Phi Decks were real professional equipment in the days before floppy disks. Only digital group had this feature within the price range that computer hobbyists could afford. For those who could not afford Phi Decks, Dr. Suding designed one of the simplest, fastest and most reliable audio cassette interfaces ever made. Cassette interfaces using the Kansas City Standard ran at 300 baud but Dr. Suding's interface ran at 1100 baud, recorded and reproduced accurately. This interface was not exclusive to digital group and Dr. Suding made it available to all in the July 1976 BYTE.

You may ask "was there software for this system?" and the answer would be "more than any other system at that time." If this is true, what happened to digital group? The answer to this question is complex. Digital group was just that, a group rather than a real company. They operated on a shoestring and it was hardly ever tied most of the time. For a long time they didn't even provide cabinets. You bought the mother board and plugged in the CPU, Video, Interface and Memory boards with the

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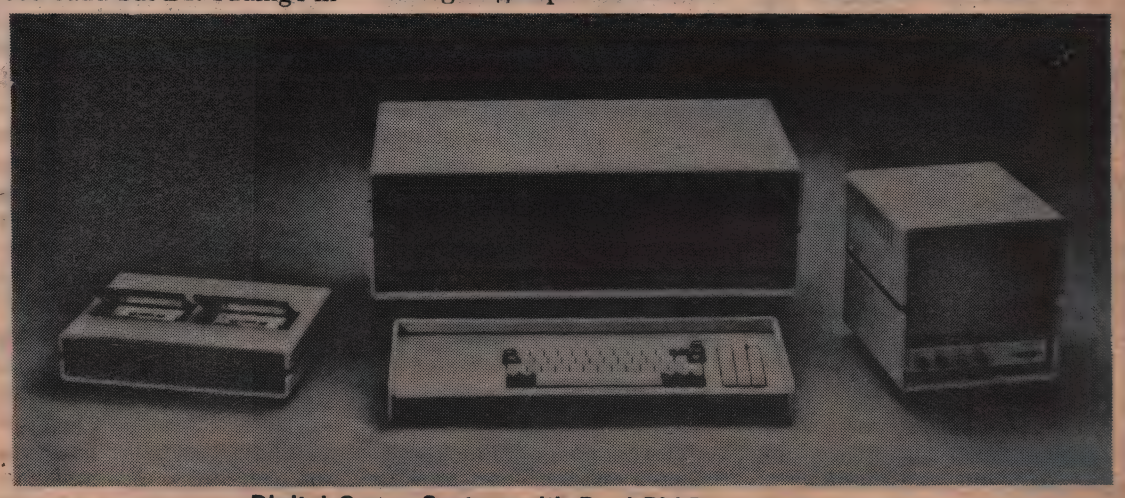


Digital Group System with Dual Phi-Deck Cassettes

TEXAS INSTRUMENTS

Randy's Ravings

by Randy Holcomb

I had scheduled a review of the Microtext Bizmaster this month but that will occur in the next issue (I have someone putting it thru its paces, so this month we will look at some educational software from Intellestar for the 99/4A and the usual news and rumors in the TI community.

Heart Attack
GradeStar
Vyger
The Everything Teacher
INTELLESTAR
25 West Middle Lane
Rockville, MD 20850
(301)898-7581
Disk Copy Protection: None
Program Protection: Yes
(except Vyger)

Intellestar has developed a line of educational program to assist both the teacher and provide some rather interesting demonstration of life sciences with some rather nifty concepts.

The program that really caught my attention was Heart Attack, which depicts a simulation of the human circulatory system. Thru the graphics and the well-thought out instructions you are then thrown into a simulation of the various functioning parts of the circulatory system on a low-level. Various indicators of oxygen level, heart rate, blood level, body temperature, blood output and a pictoral flow of the heart in action provide for quite an insight as to our inner workings. At your disposal are various functions that you can perform: you can induce white blood cells to kill germs caused by an infection, platelets to stop bleeding, and neurons to control the various functioning parts of the system. The instructions included comes with some very good examples on how these function. It was really interesting to see how some of these relationships dramatically alter the entire circulatory system. If you let things get too out of control you will start getting warning tones, and if left to their own, a heart attack occurs with the message "USE PADDLES" which gives you the option of shocking the heart back into sync or letting it die. There are 9 levels of the same, with 1-3 providing an "occasional" attack, 4-6 moves things along while the last 3 levels (7-9) challenge you to see how long you can keep the heart going before it eventually dies.

Heart Attack must be seen to be appreciated. If there is any down side to the program is the fact that its written in Extended BASIC, which makes the program suffer a tremendous speed penalty. But don't let the lack of speed distract you from looking at Heart Attack.

The Everything Teacher is a series of programs that allow custom courses to be created by creating files that contain the question and the answer which is used in programs that provide the learning interface. There are 4 game programs in the series (Baseball, TV Sweepstakes, Space Patrol — Lost! and Last Jelleybean on Earth) provide a 1 or 2 player scenario with the questions being mixed in and integrated with the game providing a more entertaining approach to learning.

I can't say that much about GradeStar or Vyger; the review copy of Vyger appears to crash whenever I try to take off from the planet (the program, not the spacecraft!) and GradeStar I don't really have any need to use it.

All of the Intellestar program come with ample documentation that explains the program setup and operation in very good detail. If the review seems too short, its because I can find little wrong with the Intellestar packages and the programs perform as advertised. Check them out.

TI News. By the time you've read this, TI has announced several new machines: The Business Pro and the Business System 100. The Business Pro is TI's answer to the IBM AT and is supposed to be "fully compatible" with the IBM AT. One nice thing going for the Business Pro is that you can stick 3 megs of main memory on the motherboard and not lose a slot for memory. Whether or not the Business Pro will help TI retain their market position remains to be seen.

The Business System 100 is quite an interesting animal. Its base configuration consists of a monochrome monitor, 256K RAM, 20 megs of Winchester and gives you the choice of being in a MSDOS environment or a DX10 (990 mini) environment. Dual environments are nothing new, Honeywell did it with their Micro 6 machine (MSDOS and a Level 6 micro) but this represents a bridge that never existed in the TI product line. The price of the 100 is around the $7000 to $8000 region and should be looked at for someone who thinks that their computing needs may grow dramatically and need the power that a mini/superminn can deliver.

CorComp has started shipping their Micro Expansion Systems to dealers. I had an opportunity to play with one briefly and it looks promising for those wanting an upgrade but who don't need the boat-anchor TI Peripheral Expansion Box (which are almost next to impossible to find these days).

Myarc has begun to ship an "improved" version of their disk controller card which will now be able to access the 360K CorComp format as well as Myarc's 320K disk format. I'm in the process of trying to obtain a test unit for comparison and will report back the findings in a later issue.

Press Release

Top Radio Supply of Detroit is announcing a 32K expansion memory upgrade for the TI 99/4A Home computer.

The 32K Console expansion places the 32K memory inside the console across the TMS 9900 processor's 16-bit data bus, yielding up to twice the performance of other memory expansion upgrades and does not require a peripheral expansion bus, due to the use of advanced CMOS RAM technology. Modifications to the TI 99/4A motherboard are required to install the 32K Console memory upgrade. Initial shipment of the 32K console upgrades is slated for June 1, 1985.

The 32K Console Expansion is available in 2 forms: a kit for $99.95 plus $2.50 shipping and handling, which includes all parts, the PCB, and detailed installation instructions; and an assembled and tested version for $159.95 plus $5.00 shipping and handling. The assembled and tested version requires the owner to send their FUNCTIONING console to Top Radio Supply for the memory installation.

For more details, contact Steve Borowiak at Top Radio Supply, 17885 Mt. Elliott, Detroit, MI 48212 (phone (313)366-9088).

Mention that you read about it in the Computer Shopper.

Next Month: A review of several terminal emulator packages and more in about the TI world. ●

Letter-Quality Dot Matrix New ECS Daisywheel Printer Added to Diablo/Xerox Line

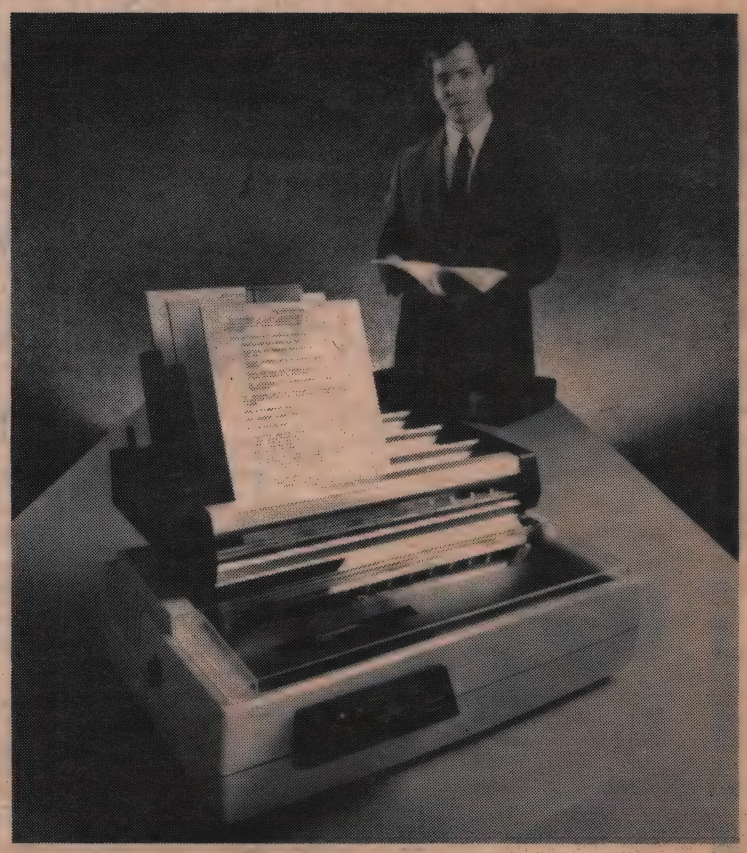
A letter-quality, dot matrix printer and new extended-character daisywheel printer were announced today by Xerox Corporation.

The Companion 34LQ printer is a 132-column, dot matrix printer that produces letter-quality printing at speeds up to 60 characters per second. In the draft-quality mode, the 34LQ can operate at speeds up to 270 characters per second.

The 34LQ has a dual interface, serial and parallel, and operates in both a Diablo 630 mode with extended-character-set capability and an alternate, IBM compatible mode.

It uses fanfold and single-sheet paper and is equipped with a single-sheet autoloader as standard equipment. The unit may be equipped with a dual-bin automatic sheet feeder as an optional accessory.

The Companion 34LQ printer is priced at $1,595. Deliveries begin this month.



Xerox 34LQ Printer

The second printer introduced today is the Diablo 630 ECS, a daisywheel printer that is compatible with nearly all personal computers and offers extended-character-set capability. The 630 ECS combines the features of two current models — the 630 ECS API (all-purpose interface) and the 630 ECS for IBM.

With an extended-character

Continued on page 44

IEM Introduces PLOT 77

You can now take advantage of the graphics capabilities of the HP Series 200 with IEM's PLOT 77 software. Accessible from IEM FORTRAN 77 and HP Pascal, it accesses color graphics and all plotters supported by the HP Pascal, it accesses color graphics and all plotters supported by the HP Pascal Language Operating System, is device independent and is CALCOMP compatible. Real-time display is possible because of rapid execution.

PLOT 77 is a library of 14 powerful, yet easy-to-use plotting subroutines. Installed under the HP Pascal Language Operating System and stored as MC68000 native code, PLOT 77 automatically constructs, scales and calibrates the axes of a graph for any array of coordinate data. Because PLOT 77 is an independent library, it may be used alone, or linked with existing software. It is callable from both FORTRAN and Pascal.

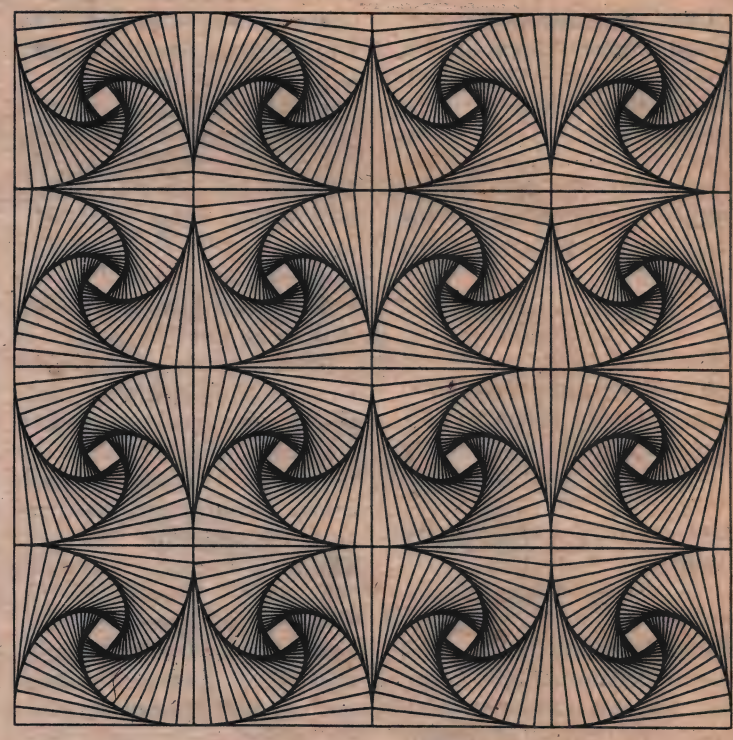
Most HP HPIB and RS232 plotting devices are completely compatible, as are most raster graphics printers (via "dump graphics" key). PLOT 77 supports all HP Series 200 color monitors (9836C, 9837C) as well as various color plotters.

With IEM FORTRAN 77 and now PLOT 77, such programs as IMSL (International Math and Science Libraries) and SAP4 (Structural Analysis Program) can easily be ported to the Series 200. The PLOT 77 Spline Fit enhancement also calculates the "best-fit" curve for the data array under analysis and displays the trend line. Plus, Automatic Axis Scaling constructs an axis with linear or logarithmic graduations suitable for most purposes.

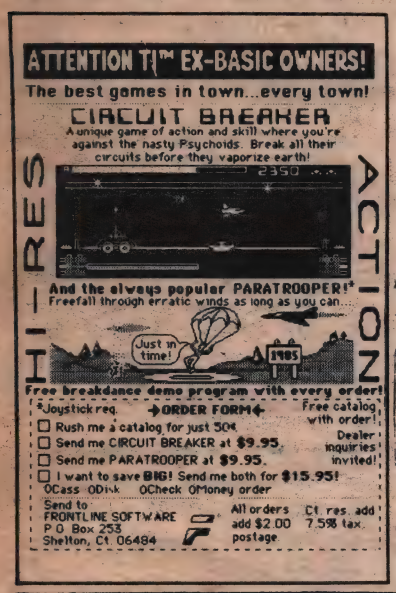
Other features include:

* Character strings and symbols.

Continued on page 158



Sample of IEM's PLOT 77 Line Drawing



Letter-Quality Dot Matrix

Continued from page 43

set (ECS), containing 192 characters, double the number on a standard wheel, you can print up to 400 characters.

The extended number of available characters and almost universal compatibility makes the 630 ECS particularly useful in scientific, mathematic, chemical, graphic, engineering and language applications.

The Diablo 630 ECS will sell for $2,295. Deliveries begin this month.

Designed for use with the new Companion 34LQ printer, the F24 is one of the first two-bin feeders for dot matrix printers. Priced at $893, the F24 will be available this month.

All three of the new Diablo/Xerox products will be sold by the company's network of distributors, dealers and retailers, as well as its direct sales force.

For further information contact Xerox Corporation, Xerox Square 006, Rochester, New York 14644. 716-423-5078.

Mention that you read about it in the Computer Shopper. ●

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COMMODORE

Inside The VIC-20/Commodore 64

The Centronics Printer Driver (And Some 1541 Hints)

by Ted Drude

This month we have a new printer driver program for the Centronics interface project we've been working on. This version is for the C-64 only. Sorry VIC-20 users, you'll have to wait until next month. We also have some information on how to live with your 1540/41 disk drive.

Attention!!!

I made an offer to copy the Centronics printer driver program to disk or tape for $2.00. That also goes for the new program I'll be presenting this month. Some of you weren't quite sure what I meant so let me clarify:

If you send me:

1) **Your** 5¼" diskette (or cassette tape).

and

2) a **stamped, self-addressed** return mailer with sufficient postage.

and

3) Two dollars cash or check.

I'll make a copy of the program for you and return your disk in your mailer. **If you don't follow the above instructions,** you will find your money, mailer, or whatever else you send to me coming back to you via return mail. So make sure you send all three items.

As a bonus, you'll get the full assembler source code to both the VIC and the C-64 versions. The Assembler source code will be in the "PAL" assembler format. I originally intended to use standard Commodore Macro format, but switched to PAL because it speeded development up considerably. I may include a Commodore Assembler version if you want, so tell me that when you order. Converting between the two assemblers isn't difficult. Because of space limits, not all of those programs can be presented in the pages of the Computer Shopper.

Send the *disk order only* to:
Ted Drude
226 F. St.
Cedar Falls, IA 50613
Attn.: Disk Offer

Address all other correspondence to:
Ted Drude
C/O The Computer Shopper
407 S. Washington Ave.
Titusville, FL 32781-9990

If you have written me, C/O the Computer Shopper, within the past 6 months, in response to my call for letters, I will make a copy for you with no handling charge. It's one of the little "extras" reserved for those who take the time to write. I must have received your letter by March 31, 1985 (I've got all the letters on file, so I know who you are). Just send the disk or tape and mailer, and I'll get it back to you. Everyone else must pay the $2.00 handling fee.

If you don't want to fool with the mailer, send me $5.00 cash or check and I'll get a disk or tape (your choice) to you. The $5.00 covers the disk or tape, mailer, postage, and a handling charge.

The Trials of a 1541 Owner

I have been tabulating comments from letters we have received over the past few months. One area of common interest has been disk storage. People are looking for faster and more disk storage than what is available with the 1540/41 drives. If you have ever used any other brand of computer, you know, by comparison, that the VIC and C-64 have suffered somewhat. Their serial bus drives are relatively slow and only hold 170K per disk (360 - 1200K is common nowadays for most floppies).

The new 1571 and 1572 drives promise to be a partial answer to some of our problems. They will be double-sided (DSDD) drives that will hold 360K - 400K per disk (depending on format). When used with the C-128, they will run 5-50 times faster, too. But, alas, when used with the C-64, they provide larger storage, but not any higher speed. When they show up, the 1541 may fade into oblivion, but until then, we are "stuck" (or are we?).

Even though they do have their limitations and problems, the 1540/41 disk drives are generally a bargain and provide good service for the money. In the interest of making life a little more bearable for the average Commodore owner, here are some 1541 "hints and tips" to make life a little easier...

Head Alignment (or more correctly "misalignment") is the number one service problem that occurs to the 1540/41 disk drive. Here are the symptoms of this problem:

After several months of daily use, read and write errors start appearing on disks that you have used for months. Then, it becomes impossible to read disks created by other 1541s. Eventually, its impossible to LOAD any programs you've saved previously with the same drive. If this describes an experience you've had (or what to avoid) read on...

Drives That Go "BUMP" in the Night!

The two primary reasons that 1540/41 drive heads go out of alignment are:

a. Copy protected software doing the "bump" as part of the loading process. The "bump" is the sound of the drive head beating itself violently against the insides of the drive. Since head alignment is measured in hundredths of an inch, it is simple to see that this kind of beating can easily cause trouble.

The "bump" is difficult, if not impossible, to totally eliminate (short of rewriting the DOS ROM chip, which, by the way has been done, as we shall see). Sometimes, this one-line program will help curb drive "bumping" when run immediately before loading copy protected software:

"OPEN 15,8,15: PRINT#15, "M-W:"CHR$(106)CHR$(0) CHR$(1)CHR$(133)"

You might try it and see if it helps. Don't be surprised if it doesn't. Of course, the best answer is for software companies to avoid using it as a protection scheme. But most software companies could care less about your disk drive. After all, if it breaks, it's not coming out of their pocket!

I applaud Pro-Line software (the distributors of "PAL" and "POWER" among others). They are using an effective copy protection scheme on their "WP-64" word processor that doesn't ever "bump" at all. It makes me want to give them my money simply for the consideration on their part.

b. Overheating of the

Continued on page 80

CBS Stuff

by Cheryl Peterson

Sea Horse Hide & Seek

Sea Horse Hide and Seek is a game for pre-schoolers that does very little besides entertain. It makes no pretense about requiring the youngster to learn something, it just keeps them busy. And I heartily approve. Kids should have a break now and then from all the "educational" software that's out there.

Because it's on cartridge, it is easy for the child to get it started. Once the main screen appears, all that's necessary is to choose between a one or two player game. Plug a joystick in and go to it.

The character is a cute little sea horse who must maneuver through an obstacle course of preditory fish. There are tunnels to swim through and rocks in which to hide. By changing the sea horse's color to that of the background, the bigger fish won't see him. Using the joystick button, the sea horse cycles through the possible colors.

The object of the quest is to reach the sunken ship, where a pettard will rise in your honor; one for each successful trip to the ship.

The high quality of the sound and graphics of the game is inconsistant with its market price, but who's going to argue with a bargain. The hammerhead shark (literally a fish with a hammer pounding it on the head) is just one of the cute antagonists that confront the sea horse. Each fish has its own little melody that plays as it wanders across the seascape, providing an audio cue that danger is near.

As my youngster is only two, she has problems mastering the joystick. She can handle up and down and back and forth arrows just fine, but moving the joystick controller and holding the base down at the same time is beyond her yet. So instead, she likes to direct Mommy. "You play, I'll say where to go. Go that way! In there. Change color. No, green!" It seems to work okay.

One nicety is the lack of on-screen violence. Should the sea horse wander too near one of the bigger fish, it chases him off the screen. You never really see the sea horse get eaten. Instead it just appears back at the beginning screen. The screen scrolls right to left

Continued on page 46

CBS Stuff
Continued from page 45

without a flicker. There are about three screens that must be crossed to get to the ship.

This is a nice little game, and the price is certainly right.

Letter-Go-Round

Another of CBS' collaberation with Jim Henson's characters, this one features Grover, Barkley and Cookie Monster at the fair. Grover rides a skateboard; Cookie Monster rows around in a bathtub, but poor Barkley just runs. A keyboard overlay with pictures of the three of them is provided with the package. Each game is played with only one of the characters.

The game is designed to be educational and fun. Letters are in the seats on the ferris wheel. The player hits the space bar when the letter he wants is at the bottom of the wheel. Depending on the level of the game, the player may just be trying to match the letter that is brought out by his chosen companion for the game. Or he may be trying to pick the letter that would fit in the space in the word on display. In yet another level of difficulty, the player must guess all three letters in the word.

Like most of the CBS games, this one has great graphics and sound. The reward for success is a dance from Cookie Monster, Bert and Big Bird. The tune that accompanies the dance is a cute little ditty that will follow you around the house even when the machine is off.

With the inclusion of the keyboard overlays, this game can be played by children at a very young age. With a little adult supervision and prompt ing, it could be used to help children learn the alphabet. But by itself, it will only teach kids how to match two things that look alike. When the child starts learning to put letters together to make words, the "guess which letter is missing" scenario would probably be tantalizing for a few weeks.

I'm not sure I would pay $35 for this program. But if I could get it at a discount, it would be a pretty good value.

Big Bird's Fun House

Here on the other hand is a program that's worth it. At $35, it's reasonable.

Big Bird and his friends (Telly, Oscar the Grouch, Grover, the Count, Snuffy, Bert and Ernie) all want to play hide and seek. Big Bird is "It" and the player has to help him find the others. At the easiest level, only three of the Muppet characters can play. The child has to pick which ones. Hitting the space bar sends everyone off to hide.

The graphics here are great. The characters run around the screen, blow a horn, slide down a chute into a swimming pool, run across upstairs porch or in and out of various windows accompanied by a song and other strange noises. When things at last calm down, the child must remember who is playing in the game and hit the character's button on the keyboard overlay. For incorrect answers, Big Bird appears and shakes his head "No". If the choice is correct, that character pops out of hiding.

There are several attempts given for each character. The program will even give a musical cue that is assigned to the next character that should pop up, after an incorrect choice. Each character has his own little theme song. Although there may be more than one character left to find, the program remembers the order in which the child picked his playmates. It won't give an incorrect answer response if the child chooses a character out of turn in the lower levels. It just uses the order when giving helpful hints.

If more than three wrong answers are given in succession, the next character in line will pop up for a second. There is also a popup key that the child can use if he's really stuck.

When everyone in the current round has been found Big Bird comes out and skates around. There are several rounds in each game.

There are five levels of play, starting with the three playmates level. At the second level, the child may choose as many playmates as he wishes. After they've hidden, some will popup right away. The others will appear in the windows that are open, if you can identify them. Under parental supervision, this would be the time to ask how many of the friends are still missing. By counting the open windows, the youngster will know. Play continues as in the first level.

At the third level, there are no on-screen clues as to how many friends left to find. The youngster must remember how many (3 to 6) playmates he chose and who they are.

At level four, the child must remember who he invited and the order in which they were chosen. Starting with three playmates and progressing to five, the child must pick each playmate out in order. For this level, it is recommended a parent have the child name each playmate aloud.

At the last level, Big Bird chooses the playmates. Starting with one friend, characters pop up in the windows. The child must press the corresponding keys in the correct order to duplicate the sequence. As long as he keeps getting them right, one more character will be added each time. The characters can appear more than once in the sequences, so it is possible that the player could build up to remembering a long sequence. Missing one starts a new sequence of characters with only one playmate, so the player must build up to a high number all over again.

The graphics and sound with this program are great. My daughter had no trouble identifying any of the characters. The little tunes are really quite characteristic of the "friend" they represent. Oscar's, for instance, sounds quite "trashy". Snuffy is rather ponderous, while the Count's hides a faint air of mystery rather reminiscent of Dracula movies.

As an aid to memory skills, this program works very well. It is certainly entertaining enough to keep kids engrossed for hours. And like most CBS games, the many different levels of play help the package stay useful for a longer period of time. This is one my daughter keeps coming back to. A good enough recommendation for any package.

Big Bird's Fun House - $34.95, cartridge

Letter-Go-Round - $34,95, disk

Sea Horse Hide and Seek - $12.95, disk

CBS Software
One Fawcett Place
Greenwich, CT 06836
(203)-622-2500

Atari and Commodore 64

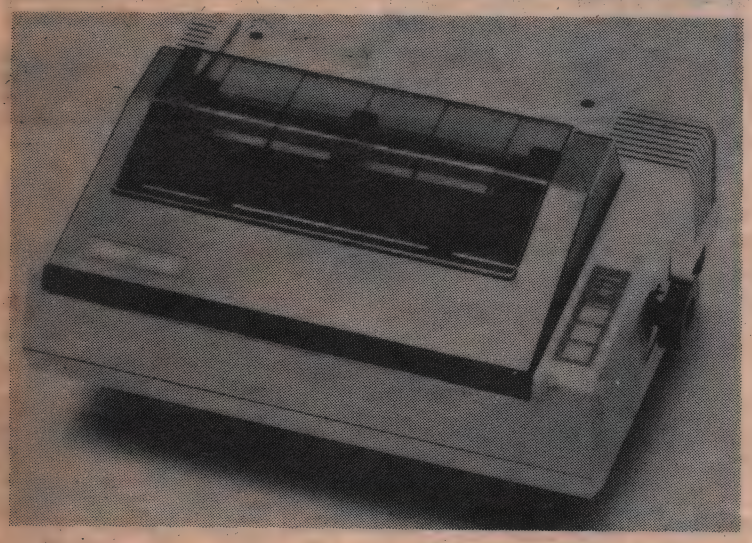
Strip Poker

Now here's a quiet way to spend an evening at home. If you can't find a warm body to

Continued on page 81

Star Continues To Dominate Commodore Market With Introduction of New Dot Matrix Printer

Star Micronics, Inc., announced that it will soon bring to market the SG-10C, the first Commodore dedicated dot matrix printer with Near Letter Quality (NLQ) as standard.



Traditional Star quality and unmatched pricing makes this full-featured printer a logical choice for Commodore end-users and retailers alike.

The new printer will offer the same high quality as the Star SG-10 with standard features such as draft mode at 120 cps, NLQ at 30 cps and both tractor and friction paper feed. The unit is designed with a built-in Commodore interface, making the new model instantly fully compatible with the Commodore 64, Commodore VIC-20 and the new Commodore 128 computers. The new printer will retail at $299, the same price as the Star SG-10.

"The introduction of this new printer reinforces Star's dominant position in the Commodore peripherals marketplace," commented Tom Bongiorno, Director of Marketing for Star Micronics. "Not only are we offering the Commodore computer user the best quality printer available, but we are providing high speed NLQ and a forms tractor as standard equipment and all for under $300," he added.

For further information contact Star Micronics, Inc., 200 Park Avenue, New York, NY, 10166

Mention that you read it in the **Computer Shopper**.

Instant Editor/Assembler (IEA) For $5

Robin Software who has sold thousands of copies of the popular IEA Assembler is offering the complete program for only $5 plus $1 postage. This unusual offer includes the 22 page manual. IEA Assembler includes Micromon Monitor and a "Walk" program for walking through games and other software with the assembler appearing on the screen with the program. This is one of the best offers ever made for the C-64 user and it includes the use of the Robin Software Hot Line (612) 944-8654.

To take advantage of this software bargain send $6 to :
ROBIN SOFTWARE
10348 Zinran Circle
Bloomington, MN 65438 ●

ATARI

Applying The Atari

by Jeff Brenner

This month we have a handy mailing list program featuring search, editing and double-width label printing capabilities. We'll also learn more about last month's Multi-Luminance program and answer some reader mail.

Programming Tip Correction

M. Rose's programming tip printed in April's column (page 56) said to SAVE a renumbered program from Microsoft BASIC and then ENTER it back in with Atari BASIC.

```
MAILING LIST PROGRAM

ADD NAMES

EDIT

PRINT

LIST NAMES

FREE DISK MEMORY

SELECT:
```

Figure 1

However, as several readers keenly discovered, in order for Atari BASIC to read the program, Microsoft BASIC must have saved the program in an untokenized format. The LIST command, not the SAVE command, must be used for the program to be stored on disk or cassette in the untokenized form. The corrected procedure for using Microsoft BASIC to renumber a program written in Atari BASIC follows:

First, LIST your Atari BASIC program on cassette or diskette. Boot up with Microsoft and LOAD the program. Execute the RENUM command and LIST the renumbered program back to cassette or diskette (LIST"C:" or LIST"D:filename"). Then ENTER the program back in with Atari BASIC. Microsoft will renumber all Atari BASIC statements with line numbers except for the TRAP statement.

Reader Mail

I hesitate buying disk programs that can't be copied. If I pay that kind of money for a program, then I feel that I should have the right to make a backup copy, as I did with my DOS 3. If you are familiar with a method that will produce backups, please let me know.

Elwood Ethridge
Georgetown, SC

For making backup copies without expensive disk drive modifications, independent diskette duplicating machinery, and the like, I can only recommend that you try using the "Duplicate File" option from DOS. Today's computer software for the Atari is highly protected from most copying schemes, and the majority of so called "copy programs" that I have tested in the past are not any more successful than DOS in making backups.

A program's ability to be copied should not be of consequence when deciding whether or not to purchase the program. In many cases, the better a program is, the more difficult it is to copy, since the manufacturer puts more work into protecting it.

I have always supported manufacturers' use of copy-protection methods except in cases where the legitimate user is inconvenienced.

Software piracy makes copy-protection a necessity. Indeed, piracy has contributed to the decline in good software titles being released for the Atari today. It is also responsible for the high cost of new computer programs. Ultimately, copy-protection is in the best interests of both the software manufacturers and the legitimate users.

As a former owner of an Atari 800 system who has recently purchased an Atari 800XL, I am very upset with the lack of documentation included with the XL. My 800, I recall, came with a manual describing the BASIC commands and other useful information. My XL, however, included basically a set-up guide

Continued on page 48

```
EDIT

Computer Shopper
FULL NAME

P.O. Box F
ADDRESS

Titusville, FL  32781
CITY/STATE/ZIP

MAGAZINE
CATEGORY

SEARCH FOR WHAT NAME?Shopper
FOUND
PRESS > TO MOVE FORWARD
PRESS < TO MOVE BACKWARD
PRESS ESC FOR MENU
```

Figure 2

Berserker Raids

Review by Jeff Brenner

When I received the package from Simon and Schuster, I couldn't wait to open it. One of the best known book publishers in the industry couldn't produce anything less than a masterpiece in computer software, I thought. Upon opening the package, my enthusiasm grew. The software product was manufactured like a book, polished hardcover and all, consisting of spiral-bound documentation and a diskette in a plastic sleeve.

Well, I am now convinced that Simon and Schuster had some sort of mission in making this product look like a book - possibly to emphasize the validity of the maxim, "Don't judge a book by its cover," when applied to computer software. Indeed, **Berserker Raids** has exemplified that computer software packaging can fool the eye as much as any attractive bookcover can.

Berserker Raids

Perhaps Berserker Raids would be most enjoyed by those familiar with the series of books and stories about the berserkers. These stories were written by Fred Saberhagen, whom the product cover describes as a world-famous science fiction author. (The programmer, Lloyd Johnson, is described as a "first-rate science fiction programmer" - of course!")

The berserkers are space-warrior robots with orders to destroy all life forms in the universe. The game situates you in a galaxy of ten stars in which you, your opponent, and the berserkers are each trying to gain control.

The Game

At the start of the game, you are asked to input a variety of game parameters, including the number of players, the number of berserkers and the power of the berserkers. Next, a "map" of the ten stars appears. The stars that you control are represented by plus (+) signs, while the other stars are represented by asterisks. I'll talk about these crude graphics later.

The first thing you'll want to do is build some ships on your star base. The manual lists a variety of ships that can be built, ranging from a simple, unarmed merchant ship to a full-fledged battleship. Depending upon the complexity of the ship, construction can take anywhere from two to over 40 years. The first ships you'll build are unarmed merchants, since these require the shortest time to build and can be used to transport materials to other star bases.

Allocating Resources

Each star base has a certain number of base points, a technology level and a productivity index. The more base points a star base has, the more able it is to defend itself from attack. Bases with 40 or more points can construct their own ships. Merchant ships can be used to bring cargo to any star base to give it the 40 base points necessary for building more ships. Each merchant ship can carry cargo worth up to ten base points.

The technology level of a star base determines the effectiveness of the weapon systems on the ships constructed on that base. This factor becomes apparent later in the game when your ships must battle your opponents's ships or the berserkers. The beams and missiles of ships built by a base with a high technology level will be much more accurate than those of the ships built on lower-technology bases. The productivity index measures how rapidly the base can build ships.

The owner of a star base can allocate the base's resources among technology (increasing the technology level), productivity (increasing the productivity level), and the construction of ships. At the beginning

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I Touched The New Atari 520ST Computer

by Clay Houston

Last night, I touched, fondled, played with and generally fantasized with the NEW Atari 520ST computer.

Versatile Video in Dunwoody Village, in Atlanta, Georgia and the C.O.N.T.A.C.T. user group of Atlanta pulled the local computer coup of the year by arranging for Steve Cart of Parades, the southeastern distributor for Atari to give a HANDS-ON demonstration of the new Atari 520ST and the 130XE computers. The presentation was held two evenings, 1 and 2 April 1985 by reservations only and as expected, was very well attended. This will be an attempt to pass on what I saw, heard and did at the presentation.

Steve brought a prototype (No. 13) 520ST supported by a 3½ inch 500K floppy disk drive and an Atari RGB monitor and a production 130XE supported by a standard 1050 disk drive, a two button Mouse and an Atari hi-resolution RGB monitor. He had a small amount of support/demonstration software but it was highly guarded as Atari's policies seem to heavily control all future software. This may not be too bad since all software will be under $80 and $50 for the two units, respectively. If the real software lives up to the demo stuff, it will be worth it.

520ST Computer

The 520ST presentation was centered around the Desk Top Manager system having many obvious comparisons to the Mac but in COLOR! The DTM uses ICONs and the GEM system developed by Digital Research as the Mac does. My son, the computer genius with a Masters from Georgia Tech bought a Mac last year because it was the "best on the market at that time" so I have had many demonstrations of the ICONs, GEM and the 68000 CPU. With Atari combining all of that capability with their color graphics approach, the 520 has got to be a fantastic computer. And it's only $599! Add to this, combining the 512K full memory plus 192K ROM augmented by a 128K ROM cartridge being supported with the $159 3½ inch drive that dumps data at a 1.33 MegaByte/Second rate you've got a real computer. (I think the disk transfer rate means that it takes a half second to dump the full memory to a disk.) The system is not expandable, but with this much power, expansion may never be required. I'm sure if necessary, some disk file chaining techniques could be used to expand to a virtual memory environment.

It has the disk handlers in ROM along with the desk Top Manager program. They will be going to the standard ASCII for the 520 and away from the ATASCII currently used in the 6502 systems. The disk drives will be the 3½ inch type with the Sony format. The disks will be single sided, but when they hold 500K bytes, who worries. Disks will run about $4 each. I figure that will change as demand increases. Several drives can be chained together; just how many, Steve wasn't sure, but surely up to four.

The whole computer and keyboard was in a sturdy, functional package about the size of the PC keyboard alone. It had a keypad on the right side and !!! one-finger cursor control. (No more CTL-Arrow, just Arrow.) It has two joystick ports, one of which is used for the two button Mouse controller. Only one button is used at this time. The other one is for future expansion (i.e., right hand cartridge approach). The Mouse as a controller when combined with the GEM/ICON approach is an excellent tool. There are well planned output ports such as both serial and parallel printer ports that require no new interfaces. The drivers are in ROM. There are ports for both the RGB monitor and TV RF line. Steve had both the monitor and the TV on-line at the same time for viewing convenience. The difference in resolution was notable. The TV was not bad; the monitor was just so much better. It, and the 130XE come with built in MIDI that can be tied into high quality music synthesizers. There is also a port for the new 10 Mb hard disk that may become available this fall.

The DTM was the only demonstration presented on the 520. Atari has not allowed software outside their control so far. The DTM has preference control of the ICONs, like locating all on the right side of the screen. It has a drop down menu for Desk, File, View and Options. The later is where you set your preferences such as Mouse double-click speed control which is like some type of debounce control adjustment. If you want a high speed Mouse usage, you can adjust the time between pulses. The Desk allows you to adjust your ICON locations and such. The four ICONs shown were designated File, Floppy, Trash and Cartridge. The drop down File menu allows you to page through a series of drawers in which ten envelopes are contained, each of which contains a program or data files. The View allows you to create windows for looking at, for example, four different data files at the same time in a configuration you select. Having been shamed by my son and his Mac, I think they are equivalent and the Atari is in COLOR! The 520 will also have a screen calculation supported by either the Mouse or the keypad.

130XE Computer

The 130XE is classed as a repackaged 800XL with an additional 64K memory controlled by the bank selection technique. They have gone back towards the DOS 2.0 calling it DOS 2.5. It will handle a true double density disk format also. The package looked and felt comfortable and of good quality. It can use all of the 800 programs without the translator disk. If the program worked on the XL it'll work on the XE. It will sell for around $169. It has to use the 1050 disk drives for now. They think the 3½ drive will become available in the fall. They are developing a combined version of AtariWriter, Spell Checker and MailMerge. They had a graphics demo from a German that was one of the sharpest I've ever seen on an Atari. It was using the RGB monitor but I have to say it was one of the clearest I've seen produced by any computer. Their medium resolution monitor will be $299 to $349.

To Buy It or Not To Buy It

I did like the 130XE but not as much as the 520ST. I would have bought it that night but the best I could do is put down a deposit for the first delivery about the last of April. I settled for the 520ST with one 3½ inch disk drive. I hope to get several of the two dozen $80 programs expected to be released with the first round of computers. They say that there should be enough out by July/August to satisfy us Atari fanatics.

As one of the first 520 owners, I plan to write a follow up to this on what it's really like to be able to use one of these top quality computers for hours and hours. ●

Applying The Atari Continued from page 47

and that's all. I am mainly interested in learning about the POKEs and the PEEKs unique to the XL but don't want to start spending hundreds of dollars on books. I hope you can include this topic in your column. I think many of your other readers would also appreciate this information on the XL.

Douglas Mann
Santa Rosa, CA

As the price of Atari computers declined, so did the amount of documentation included with the machines. This is unfortunate, but don't fear... Next month I'll list some of the important memory locations on the XL and how to use them.

More on Multi-Luminance

Those of you who entered last month's Multi-Luminance program might be interested in adding this attractive shading capability to your own BASIC programs and Graphics 0 screens. The sample application program demonstrated two of the many uses of the simultaneously displayed screen tints. It printed a menu, bordered on top and bottom by triangles composed of varying shades of color. This makes for a truly appealing display, otherwise unattainable without the use of the display list interrupts employed by the Multi-Luminance routine. The menu operation further illustrates this ability to mix luminances on the screen by highlighting the selected option.

To use the Multi-Luminance program in your own BASIC program, your program must first GOSUB 30000 to initialize the routine. The routine must be reinitialized after a GRAPHICS statement, and therefore a GOSUB 30000 should follow every GRAPHICS 0 command.

The luminance values are stored in memory locations 1767 through 1790, one location for each line of the screen. There are eight possible luminance levels ranging from zero through 14 on every even number (two, four, six, and so forth). Upon initialization, all locations are loaded with a luminance level of ten, the value that is normally used for the GRAPHICS 0 display.

Let's try changing some luminances. Enter the Multi-Luminance program (*Program 1* of last month) and type GOSUB 30000. When you get the READY prompt, type:

```
POKE 1767,0
```

This will set characters on the first line of the screen to the lowest intensity. This corresponds to the command, SETCOLOR 1,0,0, but affects only the line controlled by location 1767 — the first line. Now when you type or print on the first line, the characters will be darker than those on the other lines of the screen.

The following formula can be used to set a specific line of the screen to a certain luminance, where LINE is the line of the screen (zero through 23) and TINT is the luminance value (zero through 14, even numbers):

```
POKE 1767 + LINE,TINT
```

Note that the first line of the display is numbered line zero; the second line, line one; etc.

Dynamic luminance changes are possible as well. Type in this example and RUN it:

```
10 FOR I = 0 TO 23
20 POKE 1767 + I,PEEK(20)
30 NEXT I
40 GOTO 10
```

Have fun with the Multi-Luminance routine. If you dream up any fascinatingly unique applications for this program, please write and tell us about it.

Mailing List Program

This month's feature program, *Mailing List,* is our longest one ever — over 130 lines. It's a program that stores names and addresses, allows user categorization, searches by name, and prints by category on mailing labels. You'll truly appreciate this program whenever you have to send anything to anybody — greeting cards to friends and relatives, letters to clientele, etc. In future months, we might add additional routines to this program to make it even more powerful.

Disk Drive Required

Since *Mailing List* relies extensively on *random access* storage, a disk drive is needed.

Random access means that any portion of the data can be read at any time. In the mailing list program, random access allows the program to read one of the last names on the disk, and then go back and read one of the first names if necessary.

Names on a cassette tape can only be read sequentially, or in the order in which they were saved on the tape. For searching or editing to be feasible, *all* of the data on cassette would have to be loaded into the computer memory and then resaved when operations on the data were finished. This would limit the amount of data storage to the amount of memory re-

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SANYO

The Silver Box
Part I

by Richard Fujita

The author is a part-time programmer and writer. His main business is a partner in an importer of electronic components and supplies. A graduate of a Japanese university and he started as a TV design engineer and has wide knowledge and experience in electronics and business.

The Sanyo Is A Smart Silver Box

The silver box is a smartly designed, very reliable machine and all the software you get with the computer works very well. I use my Sanyo computer everyday running the Wordstar and other programs. I find the machine is very reliable. For almost one year of usage the machine never caused any error, except when I made a mistake. I had to work a salvage operation on one of my ASM file disks using the IBM DOS utility, RECOVER.COM which is not included in Sanyo package of DOS. This happened when I took directory on DOS 2.11 disk while the machine was operating on DOS 1.25. The results were nothing less than a major disaster. You should throw out DOS 1.25 once you get 2.11.

Inside Story of Sanyo

Because I am curious, I took my Sanyo apart on the very day the computer arrived (a procedure I do not recommend to everyone else). The main board came out when I took off several screws on the back. It just slides out, if you pull off several connectors. The board is small and compact. It occupies less than two thirds the floor space of the cabinet and about one half the size of IBM PC mother board. The Sanyo board differs in several important components. It does not use the 8237A DMA controller as in the IBM PC which limits disk operations in 64K hardware boundaries. A DMA chip is a fine adjunct but it cannot access next row of 64K RAM chips without CPU intervention. Instead, Sanyo uses a software polling technique to interface with the disk controller, the old and familiar 1793 alias MB8877. This method permits access to memory space without above restriction. Some copy programs for the IBM PC will not interface with Sanyo since it manipulates the 765 disk controller directly to read and write abnormal sectors.

One other departure from IBM PC compatibility is the location of the video RAM area. The IBM color card uses segment address starting at $B800, however the Sanyo 555 uses the top 16K area of RAM, which varies depending on how much RAM you have installed in the computer. If you have 256K installed, the video RAM address starts at segment $3C00. This is the reason why Lotus 1-2-3 does not work, since Lotus writes to video RAM area directly, and not through DOS. However, this problem is now solved with the Sanyo color board.

Translated Wordstar, Is It Better?

I started with the Wordstar program I use almost everyday. It also worked fine, except for the dictionary maintenance which I intend to discuss at a later installment, but the speed of execution got my attention. I have another computer I call 'Nature Boy' since he has always been naked from the time it was born in summer of 1980 after more than 8 months of hard labor. This S-100 Z80 computer running at 4MHZ handles all tasks really fast. It scrolls faster than a wink of your left eye.

However, with Wordstar installed on the 8088 CPU, the speed is just slow. Scrolling one page up or down takes about 5 seconds on Sanyo but the same operation on my Z80 machine is done in about 1/5 seconds. This is a speed difference of 25 folds. Do you want to know the reason? I have an inborn inquisitive mind and I was determined to find the reasons. The first thing I found was the curiously larger program size. The 8088/8086 version of Wordstar has 21,376 bytes while CP/M80 version has almost exactly 16,384 bytes. Yes, I was wrong. The 8088 has efficient 16 bit and 32 bit commands but any program translated or interpreted through a higher language such as C or Pascal is destined to be slow and this is the course I suppose Micropro took instead of writing another version in an assembler. I agree wholeheartedly that the IBM Macro Assembler is tedious and 8088 code set limits writing of good code. The most I protest is the range of conditional jumps. The distance limit is 128 bytes up or down. The allegory is something like having one-half gallon fuel tank in your big, shiny Cadillac. Indeed, the most errors I get from the assembler is "Near JMP/CALL to different CS" or "Unreachable CS." The IBM Macro Assembler magnifies this problem. I very strongly suspect a bug in the IBM Macro Assembler regarding this one. It seems to occur too

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Disk Formats For Sanyo 550

The following article untangles the various disk formats available for the Sanyo 550 computer, and describes how to go about upgrading a Sanyo system for optimum performance.

One of the oddest things about the Sanyo 550 is the profusion of different storage capacities and Disk Operating Systems (DOS) available. The Quad Disk format is vanishingly rare on the IBM PC. On the Sanyo it is quite common. Few IBM owners use anything other than the Disk Operating System which came with their machine, whereas the Sanyo National Users Group estimates 25% of its membership is using some form of third party DOS.

The Sanyo system the author uses will read and write 160, 180, 200, 320, 360. Two types of 400, and 800K format disks.

Why The Confusion?

The original Sanyo machines featured only a very limited storage capacity. Marketed with TEAC 54A half height, single sided disk drives, the 550 was sold with MS-DOS 1.25 and limited to a single sided 8-sector format: 160k per disk. This machine is still marketed as the 550-1, with a list price of $895.

The single side 550 was frustrating to use with its bundled software: Only very short documents could be used on Wordstar due to space restrictions, and until the "SCOPY" program was released, it was impossible to transfer a single file from one diskette to another.

Even with the more expensive 555-1, owners noted problems in updating the dictionary of the bundled software Spellstar, and could not use more powerful commercial programs such as Microspell.

As there are no hardware limitations on the Sanyo 550 motherboard regarding control of Double Sided or Quad Density disk drives all that was required was the replacement of the existing disk drives and suitable software to drive them. There existed an ideal "window" for third party manufacturers to offer inexpensive upgrades to the Sanyo of the time.

The first company to offer a modified DOS capable of giving Sanyo double sided storage was Michtron. The first DSDOS was a modified DOS 1.25 which could format disks to 8 or 9 sectors, single or double sided. This DOS appeared identical to the standard one marketed by Sanyo, aside from it's formatting capabilities. This early DOS had some quirks, and we have documented instances where it would cause a system crash when using large programs as Spellstar.

Next came the AOK company with their modified DOS 1.25. It had one great advantage over the Michtron offering: It could provide a one keystroke ASCII or graphics screendump (a feature found on the IBM PC, but not included by Sanyo on the 550).

These software packages all assumed that the computer owner or their dealer, would be willing and able to install

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More About Sanyo Users Groups

In the article in the March issue of Computer Shopper we mentioned a National Sanyo Users Group. We seem to have offended other Sanyo Users Groups by this mention particularly the Sanyo National Users Group which is the largest Sanyo Users Group in the world and The New York Sanyo Users Group. We did not mean to offend anyone by our article, what we were trying to do was to help our readers.

SNUG publishes a very fine Newsletter and includes notable members including Mark Zeiger of Sanyo and many others. It is the information hub of the Sanyo users community and provides vital services to other users groups throughout the country.

The New York Sanyo Users Group also wrote us about the article and said they are the largest users group in the United States and the most cohesive.

Computer Shopper supports all users groups, big and small and urges its readers to join the user group of their choice.

Sanyo National Users Group
P.O. Box 2084CS, Pullmen, WA 99183
Att: Michael Russell.
(509)878-1714

New York Sanyo Users Group
P.O. Box 182 Times Plaza Station
New York, NY 11217
(212) 855-9029; Att: Maria Pulgar, V.P. ●

The Silver Box
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frequently. These are the errors I get when I put a 'near procedure' later than the references, even next to it.

The other reason why an MS-DOS machine is slow lies in the operating system itself. Besides the fact that it has a large assemblage of commands and larger size which tends to slow the execution speed somewhat, if you study display systems in recently arrived computers you will find many of them use graphically produced fonts in color mode. Our Sanyo is a color machine. My educated guess is that all characters are synthesized from a 128 byte long and 8 byte wide character table and from attribute bytes, bit by bit. Just one character takes incredible 24 bytes to write it on the screen, whether it is a period which is composed of four small pixel dots, or a character A or B. This process is necessarily much slower comapred to using a character generator. However, it is extremely flexible to display any shape of complexity if you take time to compose a new table. In Japan almost all new computers use this technique to display Kanji characters.

Wordstar Initial Parameters

After writing two or three ASM programs and numerous letters, I now decided to set some parameters in the Wordstar program. Otherwise you have to enter these every time you bring up the system.

I use OKI UL82A printer for whatever typing need, Pascal or correspondence. I am very thankful to my customers who accept my letters typed by Oki printer, which is not quite near letter quality. When I hooked up the Oki to print Wordstar texts, I noticed there were too much head margin and misplaced page numbers. To correct this situation, I had to use 'dot commands' for all the files I create. For instance, [.mt0] to set a head margin to zero to compensate for the print head position from the paper cutting edge, and [.mb8] to set page numbers in right place. Also, after a few days of use I no longer needed the help window. All this can be set by changing parameters using INSTALL.COM. I suppose all our readers know how to do it. The next step I took was to write a WS.BAT, a very short program which sets up my special disk drivers and call in the print spool program which came with the IBM 2.10. Now my Sanyo became a perfect word processor though a little slower than I liked.

Adding Words To SpellStar

I don't know why I still use the SpellStar program for spell checking. I should have tried to find a better program. It is in my opinion, too big, too slow and too little. However, I was moderately happy using it time to time until I have tried to add some words to its little vocabulary. On my other computer, I have double density 8 inch drives which have 550K each. The SPELSTAR.DCT file is about 96K long. It requires free area of about 100K if you want to update your Dictionary, 97K for the new version of dictionary and some scratch space. Somehow, I never encountered any difficulty. The disks had the space most of the time.

The Sanyo I bought was an MBC-555 with 160K drives. At the time double sided drive was not available. I had so much anguish and frustration. From the first time I tried to update the scant dictionary, the operation had halted and it never worked until I devised some scheme to do it. It calls for two blank disks. You copy the dictionary if it is not already on a spearate disk and use this for spell-checking. After spell-checking operation, you then copy the ADD word file if it was not on the dictionary disk already. The other disk is formatted but left blank. You start the SpellStar program and when the message urges you to put the diskette with dictionary, you swap the Wordstar disk with the dictionary disk and slip the blank disk into drive B. Then you change the setup to use the SPELSTAR-.DCT in A drive, and designate work disk and the destination for the new version to drive B. Then you hit the carriage return to start the operation. The process may not be hard work but does require some time and conscious efforts, besides swapping of two disks.

Has The Sanyo Keyboard German Origin?

The Sanyo is undoubtedly a darned good computer. Its keyboard may not be ideal but I think it is easier to use than the IBM keyboard which was, I assume, primarily developed for the computer programmers in IBM, not for the touch typists. Wordstar speed is slower than the S-100 machines but you can learn to live with it. You can run many IBM programs on it. I do not like the "ESC" key which you have to jiggle repeatedly for response, hardly functioning "=" key on the main cluster but you can use the same key in the numeric cluster. By the way, you might be interested to know that the keyboard has its origin in Germany. I assume the design originally came from Siemens. Where it was manufactured is a mystery. No country of origin is stamped on the keyboard.

The only other problem with the machine if you want to use the Sanyo for serious business environment would be the limited disk space in the original model. This can be taken care of by installing double sided drives in either 550 or 555 models. The MSDOS 2.11 version with Sanyo IO system which runs 360K DS drives are available from Sanyo.

Slash 80 Configuration With 96tpi Drive

Currently I have one each 40 track drive with 360K in drive A and 80 track drive with 700K capacity in B, a perfect mix match. I call this configuration SLASH 80, i.e. MBC-555/80. This configuration has a great versatility. It can give you 700K on drive B and yet you retain IBM PC compatible drive in A. This configuration can be made compatible with SANYO MSDOS 2.11. You can run IBM PC programs and MSDOS programs as usual. The so-called Super Sanyo systems with two 96tpi drives allow you to read IBM PC and Sanyo diskettes but anything you write cannot be read by 48tpi drives. Therefore, the true compatibility is lost. This is an obvious fact but I suspect it is one of what I call open secrets and not widely known to the public. Beside this little compatibility problem, the Super Sanyo should perform well.

The only draw back in SLASH 80 system is that you cannot copy a disk full of files in B drive to A. If you copy disks often or make back-up copies frequently, you may feel some inconvenience of having a dissimilar pair of drives. If so, you can add either one more 40 track, 48tpi drive or 80 track, 96tpi drive as C externally, or if you wish, you can put another drive as D, making the computer a four drive system, with two 40 track drives and two 80 track drives, a very versatile system. A book with necessary software to do this is being prepared for the people wishing to do it himself.

With this SLASH 80 configuration you can keep WS.COM, MAILMRG.COM and SPELSTAR.COM and all the overlays necessary to run the programs in one system disk in A, and keep all the data files in the 700K disk in B. You can store up to 112 files of average 6K size in this disk. The number of files is limited by the operating system. When I converted my Silver Box to have total 1 megabytes of disk storage, the disk count in my active files was reduced to 1/3 of what used to be. Now, the work load has increased and the number of disks I keep has creeped up but I cannot imagine how many disks I had to keep if I had not converted. Now, it is possible to add Wordstar to MASM system disk and use it as source text editor without switching the diskette with 700K storage for all the documents and source files.

Problems With Various Drives

I can imagine a lot of problems might come in picture if anyone buys just any drive. The option jumpers on some drives are so numerous and complicated. There are interactions and relations to each other. If you attempt to purchase bargain drives it would be much safer if you get a copy of installation manual for the drive, or at least a copy of option list showing what options you have on the drive and their selection. If you can get an option jumper map it's all the better.

The problem might come from hardware design or an open circuit, or software interface problems. Recently I had tried IBM COMMAND.COM on my Sanyo. You guessed it. I got drive-not-ready error every time disk was accessed. This problem can be overcome if you know how to set options.

Actually, I never had any real problems so far. The most common problem for the 96tpi drives are alignment. The distance between tracks are only 10.4 micro inches. If you include guardband between the tracks into consideration, the real track width is much less. You can imagine how easy to make the head off track. ●

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Disk Formats
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new disk drives into the computer. Companies began offering computers with the double sided drives installed. Belatedly, Sanyo began marketing it's own line of double sided machines, the 550-2 and 555-2. These were equipped with MS-DOS 2.11, a major advancement.

DOS 2.11 is a larger and slower set of programs, the advantage of which is advanced file handling capabilities, such as sub-directories. DOS 2.11 permitted increased compatibility with some IBM software packages. The INFOCOM line of MS-DOS games require DOS 2.11 to operate, for example. DOS 2.11 also made possible the addition of peripherals such as hard disks for the Sanyo.

Third party vendors, faced with factory Sanyo machines with Double Sided drives, decided to go one step further and offer upgraded machines with QUAD density disk drives.

All major marketers of Sanyo computers use the TEAC family of disk drives. Any IBM compatible ½ height disk drive (such as the usually somewhat less expensive Panasonic drives) will work in the Sanyo but will look slightly different. The Sanyo 550-1 or 555-1 comes with the TEAC 54A or 55A (The difference being mainly date of manufacture—the 54A has a heavier metal casing and thus is somewhat quieter). The 550-2 and 555-2 use the TEAC 55B drive. The Quad units, such as the Silver Fox, use the TEAC 55F drive.

Interestingly, if you are going to buy these drives new, there is almost no difference in price between them. A Quad drive is usually no more than $10 more than a double sided drive.

If this is the case, why shouldn't everybody run out and buy Quad density drives for their Sanyo? Because there are several possible limitations to the dual 800k system. You must, of course, purchase a third party DOS to run a quad Sanyo system, as Sanyo currently has no official support for this format.

There are three quad DOS operating systems in popular use: Greywolf, AOK and Michtron. All are now offering 2.11 based systems, and will read and write to Double Density format diskettes. But when it comes to the 800k format, they are also all unique and incompatible. For example, a Sanyo computer running AOK DOS at 800k can destroy the disk directory of a Michtron DSDOS plus formatted disk, simply by running the CHKDSK program. Further, a Quad disk drive is a ½ track device—its stepper motor will make 80 stops between the outermost track and the innermost one (as opposed to 40 steps on a Double Density drive). It is not possible to really make this drive behave like its full track relatives. Those operating systems which state that they permit a Quad disk drive to format in the 160/360k range do so by formatting the full 80 tracks of the Quad system and then "walling off' every other track. This produces a disk with 40 tracks, but each track is only ½ the width of a normal double density drive. The result is a diskette which may be readable by an IBM or Double Density Sanyo if the drives are in good alignment, but with the danger that the drive may become "lost in

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TANDY COMPUTERS

TRSDOS Topics

by Lon Andrews

OOPS!! Sorry about that. Seems I overlooked a "small" detail in the review of MICRO-DEX's xT.CAD. It is designed for the TRS 80 Models III or 4/4P. It runs on TRSDOS 1.3 or 6. The version that I was using ran on 6.1. The reader that called this to my attention will be pleased to find that it *is* designed for the Model III or 4. Sorry for the omission (Thanks, Frank!). I'll try to get it all in this month.

My wife lets me know that she thinks that I am gadget happy every chance she gets. I am not gadget happy, I simply like to use the fruits of modern technology. If we don't support the folks that are putting out the "goodies" they might stop and then where would we be? The obvious answer is mowing, pruning, digging, painting and so on. I found a couple of the new products this month that I like. Read on and see what you think.

Home Commander

The HOME COMMANDER is a centralized computer control center for utilizing the existing house wiring to control selected electrical devices in the home or office. This system contains its own processor, RAM, clock, battery backup and ROM operating system. It makes use of the BSR X-10 control modules that can be obtained from Sears, Radio Shack, AT&T Phone centers, Heathkit, DAK Industries and other stores. The modules do not come with the HOME COMMANDER (HC) unit. I found them in 5 stores without really trying so they are readily available. The HC measures 5.75 x 6.25 x 2.5 inches and weighs 4 lbs. It requires 110 volt AC.

The HC unit attaches to your computer through a standard RS-232 interface and may be used with any number of computers. Name in the docs are Apple, Commodore, IBM, Radio Shack, Atari, Osborne, Heathkit and others. It is as simple as plugging it in with a 232 cable and into a wall socket for power. Two "AA" batteries provide the backup to prevent loss due to power outage and to be sure the clock maintains the proper setting. The unit sent to us had the batteries installed. Changing them is a matter of removing four screws, sliding the case apart and changing the batteries. No problem at all. The unit is programmed by using your communications software. If you don't have software for use of your computer as a terminal you will need to get it before using the HOME COMMANDER. If you are using a data terminal no software is needed.

Connect the HC to the computer with the 232 cable but do not connect the house current to the HC before you boot up your computer. Boot up first and run your communications software so that you are in the terminal mode. Set the baud rate for anything between 110 and 9600. Plug the HC unit in the wall and send a carriage return (ENTER) to the HC. This first character sent to the HC is the basis for adjusting the baud rate of the HC to match that of the computer. If everything is correct the HC responds with "COMMAND:".

At this point it is assumed that you have one or more BSR X-10 modules in place with appliances connected. These are available as plug in boxes that the appliance simply plugs into the module. Another is an installable wall switch for light control. Each of the modules has two settings for identification — House code ("A" through "P") and Unit code (1-16). This produces several interesting possibilities for use of the HC and the modules. Each room might be assigned a House Code with several appliances in each room. The number of possible codes leaves room for the most devious imagination to enjoy for some time to come.

There are two levels of operation for the HC — Immediate mode and Scheduling mode. When the prompt "COMMAND:" appears the HC is in the immediate mode and waiting for you to give it some work. On the unit I used the following commands were available:

.h	h is a house code from A to P. The period must precede the house code.
nn	nn is the unit number from 1 to 16.
ON	Turns module on.
OF	Turns module off.
AL	Turns all lamp modules of the same house code on.
AO	Turns all devices on one house code off.
DMn	Used to dim a lamp module. n is the degree of dimming 1 - 9(bright).
BRn	Same as above except to brighten.
SO	Turns off all units on one house code.
GO	Turns on all units on one house code.
GL,GH	Turns on half of the modules in a house code group. 1-8 or 9-16
FL,FH	Same as GL,GH except turns the modules off.

Home Commander House Controller

An example — COMMAND: .F12DM4

This would dim unit 12 on house code F about half way assuming that the module was a lamp module and was fully on. The command is executed as soon as ENTER is pressed. I had fun for a while turning lamps on and off and driving the dog nuts but this has its limits. The schedule mode produces a more reasonable outlet for use of the HC.

At the COMMAND prompt answer "SC" to see the following menu:

SCHEDULE OF OPTIONS:
1 MAKE ENTRY
2 DELETE ENTRY
3 LIST SCHEDULE
4 COMMAND MODE SELECTION:

At this point any command that is entered will be executed at a time and date set by the operator. This is what gives the HC its "stand alone" capability. Once the commands are sent to the unit, and stored, the backup power assures against lost due to loss of house power. When the power is restored the HC is right there ready to work. A maximum of 224 commands may be entered and stored at one time. These may be repeating commands allowing a very large number of future operations to be set and stored.

From the menu choose 1 (MAKE AN ENTRY). The HC will prompt HOUSE CODE: (A through P), then UNIT CODE: (1 through 16), TIME: (00:00:00 24 hour format), REPEAT COMMAND or DO ONCE ONLY: If repeat is selected, 10 options will appear for REPEAT WHEN:. EVERY DAY, SUN, MON, TUE, WED, THU, FRI, SAT, MON-FRI, SAT/SUN. ONCE ONLY is followed by a prompt for DATE: in the form of mm-dd-yy. May be any date after and including the date of programming. Once the date is selected, you are returned to the SC menu ready to set another command.

Commands are sorted by date and time and stored in the HC's RAM. Each new command is stored in proper order. All stored commands can be viewed using the list schedule option.

A listing would appear as follows:

#	TIME	DAY	HSE	UNIT	CMD	DEG
001	06:30:00	WKD	B	6	on	
002	06:30:05	TUE	B	7	OFF	
003	23:28:00	ALL	F		AO	
004	23:28:30	WKE	F	8	DM	5
005	23:30:00	02-06-86	F		AL	

Entry #1 turns on unit 6 on house code B every weekday at 6:30am. #2 turns off unit 7, house code B every Tuesday at 6:30:05am. #3 turns off all modules, house code F every day at 11:28pm. #4 dims lamps unit 8, house code F halfway every weekday at 11:28:30pm and #5 turns on all the lamp

Continued on page 52

SCOOTER — More Than Just A Printer Buffer

by Lon Andrews

Shepherd Marketing has on the market a "Multi Buffer" that takes some of the pain out of having several computers being serviced by one printer. Using switches works but there are problems with this method that are eliminated with the SCOOTER.

The SCOOTER is a printer buffer that accepts data from up to three micros and feeds one parallel printer. Incoming data is stored in the buffer and fed to the printer as it is available. The model reviewed was a 64K buffer but there are also 128K, 256K and 512K models available. The unit is attractive, well constructed and about the size of an external drive unit (5.25 floppy). The rear of the SCOOTER flaunts four 50 pin connectors similar to the connector on my printer. Three connectors for computer cables and one for the printer. You need one cable (for the printer) that has two connectors alike instead of the normal cable used for computer-printer connection. I took a connector from an old cable to avoid buying a new one.

The front of the SCOOTER is different from other buffers I have used. There is a power switch and light, three CPU indicator LEDs, Pause button, Copy button, a Print LED, a Reset button to clear the memory and a Memory indicator. The Memory indicator is a row of LEDs that serves like a gas gauge to let you know what percentage of the buffer's memory is in use.

Once the SCOOTER is hooked up it is simply a matter of each computer feeding data to the buffer. Data is fed to the printer in the order that it is received by the buffer. As data is received from a CPU the LED for that CPU lights up to indicate from which CPU the incoming data is originating. If the buffer is full, data acceptance stops until memory is freed up by sending data to the printer or by resetting the buffer.

SCOOTER Buffer accepts print data from several computers

Several SCOOTERS can be hooked up together to service 5, 7 or more computers at the same time. Two or more printers can be hooked up by using a printer selector switch after the SCOOTER.

In using the buffer I could find no real fault with its operation. I did have a problem getting the copy feature to function as I thought it should. Turns out that it doesn't work the way I think it should. It works the way the designer thought it should function. It worked for me by pressing the Pause button during the printout of the document I wanted copied, then pressing Copy and restarting the printout. At the end of the document print it will repeat the print out.

All the switching is done automatically by the SCOOTER. Since I am a "lazy"person I like that feature. It eliminates the switch boxes and the hassle of deciding which printer goes to which printer. The documentation isn't long but it doesn't need to be long and involved. Aside from the Copy feature it covers the operation of the SCOOTER well. Short and to the point.

This buffer isn't what you need for home use unless you are really putting out the word processing with more than one computer. For the office or lab it is right on the mark. If you have ever tried to explain the function of a couple of printer selection switches in a small network to a non-computer oriented staff you will understand the beauty of the SCOOTER!

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TRSDOS Topics
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modules, house code F at 11:30pm on Feb. 6, 1986. Dated entries (one time commands) are deleted after execution.

Commands can be deleted by selecting the DELETE option from the SC Menu and identifying the command by entry number. You can get into a problem deleting commands as the entry numbers change as you go through the deletion process. If you delete an entry number low on the list all the numbers above the deleted one change down one. If you are deleting several commands start on the high end of the entry numbers and work down or you will do as I did and delete commands you want to keep.

Several commands can be entered for the same time. They will be executed in the order they are listed in the schedule separated by a delay of 1 to 10 seconds depending on the nature of the commands. The accuracy of the schedule depends on the HC's clock. The clock and calendar can be set from the immediate mode by using the DT and TM commands. Answering the COMMAND: prompt with TM will cause the time to be displayed. Answering the prompt with TM hh:mm where hh is the correct hour and mm the minutes will set the clock. The date is set by using DT mm:dd:yy.

That is about all there is to operating the HOME COMMANDER. Does it work? Better than I thought it would. I found no real fault with the operation of the HC at all. It was strange to stand outside my home at night and watch a progression of lights go from one end of the house to the other just as if someone was going from one room to another turning lights on and off as they passed. This was simple to set up. Even with no one home it would appear as if there were someone moving about in the house.

This would be one of the most important uses of the HC. While we are away at Disney the HC would carry on as if the house were occupied. Not to mention the swimming pool pump, watering system, outside lights and more. It can also be used to supply current date and time in ASCII format to other programs in use by your computer.

The documentation is still in the development stage but was sufficient to allow any one with the ability to operate a modem program to be able to use the HOME COMMANDER. More commands and features

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MISCELLANEOUS

Buying And Selling Used Computers

By Stan Veit
Used Computer Stores And Dealers

The Used Computer Store is a trading place that had to appear because the new computer stores have not realized the profit that can be made in offering trade-ins and selling the used machines taken in trade. I talked with the president of a large chain of retail stores who had accepted trade-ins and he told me that the machines taken in trade were being kept out of his stores because he felt that they would compete with sales of new computers. They were piled up in his warehouse waiting until he found an outlet for them far away from his selling area! By the way, the "trade-in" was really a discount that the buyer could have obtained by bargaining without a trade!

How shortsighted that policy is! The automobile industry would have never developed without used cars, the same for cameras. Who would be able to build a new house if they couldn't sell their old one? It has been proven many times over that there is more profit in selling used equipment than in selling new machines. So why not sell both in the same store, every other industry does it, why not the computer store?

The Used Computer Store is real today, they are not all over the country, but within one year they will spread all over. All the elements for success are here now. There is a lot of change going on in the industry. People are upgrading from 8-bit to 16-bit and the five year period for equipment write off is coming to an end for a lot of companies who bought computers in the early 1980's.

One of the first large dealers in used computers grew out of the Boston Computer Society. Alexander Randall, a member of Boston Computer Society saw the need for trading in used computers and founded The Boston Computer Exchange. He will buy or sell any of the popular personal computers, or find a buyer for a complete system. He does not stock machines but arranges the transaction for the buyer and seller for a fee. His service has succeeded because he is in the information business rather than being an 'Iron Merchant' who warehouses used equipment and waits for a buyer with a need.

Edward Owens in Denver is more of a traditional used computer store than Boston Computer Store. Owens runs MicroSeconds, stocks and rebuilds computers, offering users a chance to try out the machines and compare while they are looking. We all like to 'kick tires' when we are buying something and to have many choices in front of us.

The Boston Exchange does not provide this environment but MicroSeconds in Denver, or Godfather's Used Computers in Orlando, Fla. does. Each is a real store stocked with used computers. Buyers like to come to the store and just look at the bargains. Sometimes they buy and other times they decide to go with a new machine, but once they come in, say the store owners, they come back and end up buying something.

Speaking with the owners of used computer stores was an eyeopener as far as the Blue Book, or Brown Book of used computer price quotations is concerned. The store owners felt that these pricing books were not fast enough in adjusting prices. "If I dealt according to those books I would go broke in a week," one of them told me. The chief use those books have is in setting value for insurance purposes. Each dealer feels that his own knowledge of the market will be his guide until the day when there are daily quotes for all over the U.S. This same dealer told me that classified ads in Computer Shopper were a better guide to prices of used equipment than any books, providing he called the advertiser and got the best selling price.

The personal computer industry is now ten years old and the used computer market is just starting to grow. One of the things that has kept it from emerging is the so called "grey market". This is the selling of equipment at sharply discounted prices by non-authorized dealers. The regular dealers are forced to buy a quota of machines to keep their dealerships. When things are slow and the dealer needs cash to pay invoices, he may sell at cost (or even Below Cost) in order to get money to pay his bills. The grey market operator pays cash on delivery and they turn over the computers for a small markup to get the money back for the next deal. While some grey market operators are small fry, others are very large, well financed operations. In one big city, the largest retailer of computers is a grey market operator. The sale of new equipment at close to cost price has hindered the growth of used equipment stores. Often the used computer store which re-conditions equipment and stands behind it must charge more than a grey marketeer selling brand new computers. ●

Communicating With Your Dot Matrix Printer

by Randall Staponski

One of the shortcomings in listing BASIC programs on today's crop of computers, printers and software is lack of format control. When debugging a program I like to double space the listing (sometimes triple space if there are a lot of additions to be made). After the program is complete, then a single spaced near-letter quality copy is made for my file. Unfortunately the List command on most BASIC Interpreters, including my own, makes no allowance for printing options. A second shortcoming is printing return address mailing labels. I like mine dark and bold while my spouse prefers a more laid back style.

The intent of this article is twofold: (1) explain in simple terms the method used to communicate by software with dot matrix printers and (2) include a BASIC program which, although simple, will relieve some of the irritating features of printing on your dot matrix printer. The program that will be discussed is written for the Epson line of printers. However, with some detective work, it can be modified to work with other types of dot matrix printers.

All of the dot matrix printers currently available that I am aware of allow several different printing styles. On the Epson MX and FX series (I have an MX100) these include normal, double strike, double width, italics, and emphasized just to name a few. After I determined my printer could do a lot of neat tricks the next step was to find out how to communicate with it.

The instruction manual which came with my Epson printer is easy to read and understand. However, it is written on 8½ by 11 inch paper and is nearly 1 inch thick! About one third of the way through the manual I learned the secret of communicating with the Epson. Basically a secret control code is sent to the printer. Receipt of this code tells the printer to accept what follows as an instruction or control code. The printer will do what the code says but will not print it. The manual suggested that the user should memorize each control code. A quick digression to the end of the manual indicated my printer will respond to 60 control codes. Since I have trouble remembering my wife's birthday, committing 60 numbers to memory was not an option.

A little more investigation uncovered enough additional information to solve the problem. The secret code for getting the printer's attention is the ASCII code for the escape key. It can be sent to the printer using the Basic function CHR$(x). This function converts x to its single character ASCII equivalent (x must be an integer between 0 and 255). A look at an ASCII table shows the decimal value for the letter "A" to be 65. Therefore, CHR$(65) = "A". The same table shows the decimal value for the escape key is 27. The following Basic statement will get the printer's attention:

```
10 PRINT #1, CHR$(27).
```

The control code for double strike printing is "G" whose ASCII value is 71. The complete Basic statement for double strike printing becomes:

```
10 PRINT #1, CHR$(27), CHR$(71).
```

Other control codes are used to put the printer in other print modes. The Basic code shown above will only work with Epson printers and look alikes. Although the control codes are different, the same principles may be used to communicate with other printers such as the Okidata. Although much more complex commercial software, such as word processors, use the same principles discussed above to print documents. Since the control codes used by the major printer manufacturers are not standardized, most installation procedures ask the user to specify the type of printer that will be used. By installing the control codes for several popular printers, one version of software can utilize the full capabilities of different printers with incompatible control schemes.

The program shown in listing 1 combines several control codes into a menu driven program. The program is written in North Star Basic and is used on a North Star Advantage. However, it should run on most dialects of BASIC with little or no changes. The objective of the program is to easily put the printer in the desired mode (double strike, italics, etc.). This allows the user to execute a second program

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Communicating

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which sends output to the printer. The second program could be a List program or another BASIC program. After execution is complete the print mode program can be run again to return the printer to the desired mode.

A quick look at listing 1 shows there are less than 60 print codes. In fact only 6 of the commonly used functions have been implemented (menu items 1 thru 6). Menu item 7 allows you to send print codes that are not shown (you still must look the codes up in the manual). Menu item 8 allows you to input and print a string up to 30 characters long. Before printing long documents, I sometimes use this as a check to make sure the printer is in the desired mode. Menu item 9 is used to print return address labels. The printer is first placed in the desired print style prior to selecting this menu item. The user then inputs the number of labels to be printed. As written, the label section assumes the labels to be printed are one row across and three lines from the bottom of one label to the top of the next. Lines 810, 820, and 830 should be changed to the desired address.

All programs have limitations as does this one. It is designed to print an entire document in only one print style. The print style can not be changed in the middle of a document or even in the middle of a line as most good word processors can. Several of the print codes can be strung together to do new and wonderous things. Unless this is your purpose it is best to do a printer reset (menu item 1) or turn the printer off and back on before changing from one print style to another. Also when sending commands to the printer, the PRINT command terminates with a line feed. Although nothing is printed, the paper is advanced one line. Normally this is reassuring since I know the command line was received by the printer. However, it can be annoying when printing is to start at a particular point on a page. Most BASICS allow the line feed to be suppressed. With North Star Basic this can be done by ending each PRINT #1 statement with a comma. For example PRINT #1, CHR$(27),CHR$(71), would not cause a line feed during execution. The program is 101 lines long but is only 85 lines long if the REMARK statements are removed. Therefore, it is relatively simple to add or delete control codes, modify it to work with other printers, put parts of it in a user program, or rewrite it completely to accommodate your own programming style. ●

```
10 REM     PROGRAM TO SEND CONTROL CHARACTERS TO THE M 100
20 REM
30 REM
40 REM     VARIABLES USED IN THIS PROGRAM
50 REM
60  REM B$(30) IS A STRING ARRAY FOR PRINTING A STRING (MENU ITEM 8)
70  REM L1$(30),L2$(30),L3$(30) ARE USED TO STORE THE 3 ADDRESS LINES FOR
80  REM    PRINTING ADDRESS LABELS (MENU ITEM 9)
90  REM M$ IS USED TO STORE THE MENU SELECTION
100 REM I IS THE NUMBER OF LINES TO SKIP FOR MENU ITEM 6
110 REM J IS THE INTEGER TO BE SENT (MENU ITEM 7)
120 REM K IS THE NUMBER OF LABELS TO PRINT (MENU ITEM 9)
130 REM L PRINT LABEL ON SCREEN OR PRINTER (MENU ITEM 9)
140 REM M COUNTER FOR LABELS (MENU ITEM 9)
150 REM N LINE SPACING VARIABLE (MENU ITEM A)
160 REM
170 DIM B$(30),L1$(30),L2$(30),L3$(20)
180 PRINT
190 PRINT "                    MENU "
200 PRINT " RESET PRINTER ..................... 1"
210 PRINT " SET UP FOR DOUBLE STRIKE PRINT ..... 2"
220 PRINT " SET UP FOR EMPHASIZED PRINT ........ 3"
230 PRINT " SET UP FOR COMPRESSED PRINT ........ 4"
240 PRINT " SET SKIP PERFORATION TO 0 LINES .... 5"
250 PRINT " SET SKIP PERFORATION TO I LINES .... 6"
260 PRINT " SEND A SPECIFIC INTEGER ............ 7"
270 PRINT " SEND A TEST STRING FOR PRINT ....... 8"
280 PRINT " PRINT ADDRESS LABELS ..............  9"
290 PRINT " CHANGE LINE SPACING ..............  A"
300 PRINT " END PROGRAM ....................... E"
310 INPUT M$
320 IF M$="1" THEN 450
330 IF M$="2" THEN 470
340 IF M$="3" THEN 490
350 IF M$="4" THEN 510
360 IF M$="5" THEN 530
370 IF M$="6" THEN 550
380 IF M$="7" THEN 670
390 IF M$="8" THEN 720
400 IF M$="9" THEN 770
410 IF M$="A" THEN 930
420 IF M$="E" THEN END
430 PRINT "INVALID INPUT TRY AGAIN"
440 GOTO 180
450 PRINT #1, CHR$(27),CHR$(64)
460 GOTO 180
470 PRINT #1, CHR$(27),CHR$(71)
480 GOTO 180
490 PRINT #1, CHR$(27),CHR$(69)
500 GOTO 180
510 PRINT #1,CHR$(27),CHR$(15)
520 GOTO 180
530 PRINT #1, CHR$(27),CHR$(79)
540 GOTO 180
550 PRINT
560 PRINT "THE NUMBER OF LINES TO SKIP CAN BE ANY NUMBER THAT IS LESS"
570 PRINT "THAN OR EQUAL TO THE CURRENT PAGE LENGTH (USUALLY 66 LINES)."
580 PRINT "SKIPPING 13 LINES IS A TOTAL OF ABOUT 2 1/6 INCHES.  IF YOU"
590 PRINT "ADJUST THE PAPER SO PRINTING STARTS 1 INCH FROM THE TOP OF THE"
600 PRINT "PAGE THEN A 1 INCH MARGIN WILL APPEAR AT THE TOP AND BOTTOM"
610 PRINT "OF EACH PAGE."
620 PRINT
630 PRINT "ENTER NUMBER OF LINES TO SKIP"
640 INPUT I
650 PRINT #1, CHR$(27),CHR$(78),CHR$(I)
660 GOTO 180
670 PRINT "THE INPUT INTEGER WILL BE PRECEDED BY ESCAPE CHR$(27)"
680 PRINT "INPUT INTEGER TO BE SENT"
690 INPUT J
700 PRINT #1, CHR$(27),CHR$(J)
710 GOTO 180
720 PRINT "INPUT STRING TO BE PRINTED"
730 PRINT " THE STRING MUST BE 30 CHARACTERS OR LESS"
740 INPUT B$
750 PRINT #1, B$
760 GOTO 180
770 PRINT " ENTER NUMBER OF LABELS TO BE PRINTED"
780 INPUT K
790 PRINT "ENTER OUTPUT ON TERMINAL OR PRINTER  0 OR 1"
800 INPUT L
810 L1$="Mr. & Mrs. Randall Staponski"
820 L2$="3003 South Joplin Place"
830 L3$="Tulsa, Ok   74114"
840 FOR M=1 TO K
850 PRINT #L, L1$
860 PRINT #L, L2$
870 PRINT #L, L3$
880 PRINT #L
890 PRINT #L
900 PRINT #L
910 NEXT M
920 GOTO 180
930 PRINT "YOU MAY CHANGE THE LINE SPACING TO ANY INTEGER BETWEEN"
940 PRINT "1 AND 85.  A VALUE OF 12 IS STANDARD, 24 IS DOUBLE SPACE,"
950 PRINT "36 IS TRIPLE SPACE, ETC."
960 PRINT
970 PRINT "PLEASE INPUT THE LINE SPACING"
980 INPUT N
990 PRINT #1,CHR$(27),CHR$(65),CHR$(N)
1000 GOTO 180
1010 END
```


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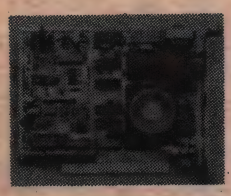

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HEATH/ZENITH

How Well Do You Know MS-DOS?

Part II

by Harold M. Bauman

Extended ASCII key numbers are used for keys that do NOT have normal ASCII definitions. BOY! That is some definition! This includes the function keys, cursor movement keys, and others that we will get to later.

The "definition" specifications is what the key will become. This can be more than one character long and can also be defined in "pieces." The pieces must be separated by semicolons. These people may be either ASCII codes in decimal, or text in double quotation marks. The lowercase p terminates the keyboard command line redefinition. When I provide a couple of examples down a few paragraphs this should clear the "mess" up. This will not be difficult. I hope that I am able to write it so that the reader will understand it.

ANSI.SYS stores the reassignment and uses it when the redefined key is pressed. Once a key is redefined, the key WILL stay redefined until it is redefined again or the system is rebooted. The PROMPT command that redefines the key can only be used ONCE. The key is redefined and the user can then create another different prompt to control the screen display.

Warning! The Keyboard Reassignments will NOT work with programs that bypass DOS to get keyboard information. BASIC interpreters go straight to BIOS for keyboard information. There may be others. The readers may have to experiment with the various programs that they use. I have only found BASIC. I am sure that once the readers learn the use of redefined keys, they will use these keys more frequently for DOS commands. If these keys did not save typing characters there would be no reason for function keys and redefined keys.

What keys should be redefined? It depends on what programs are being used or on the application. I can only explain them and stimulate the thought process. Function type keys are the first bet. (SYMPHONY uses the ten function keys for about 23 different functions as I remember.) For example, if you have a number of batch files in use, a key could be defined to run each of them. Anytime the user is typing the same command over and over, let a reassigned key do that typing so that the command can be made by pressing ONE or TWO keys.

The function keys F1 through F6 have special and useful meaning to MS-DOS and they are used often. If the reader believes that leaves only four function keys available, THINK again! Those keys are REALLY 40 keys, since they can be pressed in combination with the SHIFT, CTRL, and ALT keys. So, if we do not want to change six of them, that still leaves 34 possible function keys that can be reassigned. I will list the possible extended keys below in groups. We will refer to these as we discuss the subject further:

Now an example. If we want to redefine F7 to display a directory of the default drive A:, enter the following command:

```
PROMPT $e[0;65;"DIR A:";13p
```

This entire prompt-text command line is used for the keyboard reassignment, so these would not be displayed on the screen after the sequence has been executed! Here is the step-by-step analysis. The portion $e[0; indicates the use of an extended keyboard number. '65' is for F7 from above list. "DIR A:" is the redefinition. '13' is the ASCII carriage return and the lowercase 'p' instructs the ANSI.SYS that this is the end of the keyboard reassignment. That worked out fairly easy, right?

After the key has been reassigned, type PROMPT without any argument to restore the regular prompt. Press F7 key to execute the DIR A: command.

FUNCTION KEYS

FUNCT KEY	BASE	SHIFT	CTRL	ALT
F1	59	84	94	104
F2	60	85	95	105
F3	61	86	96	106
F4	62	87	97	107
F5	63	88	98	108
F6	64	89	99	109
F7	65	90	100	110
F8	66	91	101	111
F9	67	92	102	112
F10	68	93	103	113

TOP ROW NUMBER KEYS EXTENDED WITH ALT KEY

KEY	EXTENDED KEYBRD NBR
1	120
2	121
3	122
4	123
5	124
6	125
7	126
8	127
9	128
0	129
-	130
=	131

LETTER KEYS EXTENDED WITH ALT KEY

KEY	EXTENDED KEYBRD NBR	KEY	EXTENDED KEYBRD NBR
A	30	N	49
B	48	O	24
C	46	P	25
D	32	Q	16
E	18	R	19
F	33	S	31
G	34	T	20
H	35	U	22
I	23	V	47
J	36	W	17
K	37	X	45
L	38	Y	21
M	50	Z	44

Now before proceeding, I would like to rewrite the control format syntax three ways:

```
1--$e[n;n...np
2--$e["string";p
3--$e[n;"string";n;n;"string";np
```

All three, or any other combination of strings and decimal number(s), are correct. Does the reader see why? Another example might help. Here is a command that will reassign the F10 key to the DIR command followed by the usual return key:

```
PROMPT $e[0;68;"DIR A:";13p
```

I will let the reader analyze this command string. Also, remember to TRY some other commands with the computer. That is the only way to learn this subject. Reading this article will NOT teach a user how to do it!

A more convenient method of reassigning the keyboard keys is by using a two line batch file that I will call KEYDEF.BAT:

```
PROMPT $e[0;%1;"%2 %3 %4";13p
PROMPT
```

The first PROMPT command line is used to reassign a keyboard key. The percent signs followed by numbes are replaceable parameters of the batch file (if you do not know batch files, wait until next month when I will explain them). The second PROMPT command line restores the prompt to normal. Instead of executing the second PROMPT line, the name of a batch file that stores your favorite prompt could be specified.

NOTE! The Echo command MUST be ON for this file to work. MS-DOS must actually try to display the prompt for the ANSI.SYS to intercept a non-display command string and do the reassignment of the key. To try this batch file method, type:

```
KEYDEF 68 DIR A:
```

This will set %1 to 68, set %2 to DIR, set %3 to A: and set %4 to nothing; thus we have the following command line:

```
PROMPT $e[0;68;"DIR A:";13p
```

By selecting extended keyboard numbers from the above list, the reader can experiment with defining keys to activate the most used commands. Note that the number of batch parameters the user wants the redefined key to accept is equal to the number of items, separated by blanks, within the quotation marks. For example, the batch file I wrote could be used to define a key that accepts four parameters. To do that, the command must be as follows:

```
PROMPT $e[0;%1;"%2 %3
  %4 %5";13p
(enter PROMPT commands on one line)
```

because the %1 parameter is needed to select the key we want to redefine. We could go all out to the maximum with the following:

```
PROMPT $e[0:%1;"%2 %3 %4
  %5 %6 %7 %8 %9";13p
(enter PROMPT commands on one line)
```

but since the parameters %.2 thru %9 must be separated by blanks (to preserve the spacing in the key reassignment sequence), this command would add unnecessary characters to those key definitions that use less than eight parameters.

I have been using a zero after the left-bracket. Thus, this batch file can only reassign keys with extended keyboard numbers. Another batch file could be created without the zero and the first semicolon to handle definitions using regular ASCII codes.

Another option, without the last semicolon followed by the number 13 in the PROMPT command, would cause the cursor to stop after displaying DIR A: and wait for more input or for the user to press the Return key. The ";13" sequence puts the carriage return in. If the option of adding something to the line is preferred, leave off the ;13 (but do not leave off the final lowercase 'p'). If the user wants the function key to deliver several commands, separate each of them with a semicolon, a ;13 and another semicolon. This sequence inserts carriage returns between the commands. Refer to the three control syntax commands above.

Using the AUTOEX-

Continued on page 86

How Well Do You Know MS-DOS?

Part III

by Harold Bauman

I am sure that most of **Computer Shopper**'s readers know how to use most of the MS-DOS Operating System with their Heath/Zenith computers. However, I am sure that I can help most readers to get more from their MS-DOS Version 2 system then they are now using! This month I am going to continue the discussion of how to do this with the H/Z-100 series of computers. I want all **Computer Shopper** readers to obtain at least some new and useful information, so I will vary the contents of the article from novice level to advanced level explanations.

This is Part-3 of this series and I hope that the Heath/Zenith (and IBM-PC and Clones) readers have learned some new things about their MS-DOS Ver.2.x operating system. This month I want to put some of the things that we have been discussing to work. I feel that this is the really interesting part! If the reader will remember, last month I defined "through-put" as the speed with which problems or segments of problems are performed in a computer and varies from application to application and is meaningful only in terms of a specific application. Do you agree with this definition?

The majority of the letters that I have received from the Heath/Zenith readers have been about the computer speed; such as, how can I increase the CPU chip clock speed. As we discuss computer through-put this month, we will find that there are other factors that should be evaluated when discussing "through-put"! The material in this article will apply to both the H/Z-100 and the H/Z-100-PC and some of it will be of interest to the H8 and H/Z-89 users. (IBM-PC/XT and Clone users can also use this material.)

Let's start by looking at the computer system components:

1 - CPU Chip
A - 8088 at clock speeds of 5 Mhz vs 8 Mhz.
B - 80186 expansion boards.
C - 80286 expansion boards.
D - 80386 future expansion boards.

2 - CO-Processors
A - 8087 number cruncher chip at 5 & 8 Mhz.
B - 80287 number cruncher chip.

3 - Disk Drives
A - Floppy disk.
B - Hard disk.
C - RAM disk.

4 - Memory management
A - Buffer size.
B - Memory disk size.

5 - Software design
A - Require many I/O processing steps.
B - Uses overlays.
C - Nearly completely stored in RAM.

All of the above items determine the through-put! Some will make large differences and some will make changes that can be barely noticed. Some of the changes could be very costly and consume a great deal of the user's time (time is money in most business applications). Other changes can be made with little or no expense in dollars or time. Why do we need this elaborate dissertation then? It really goes back to our definition for through-put. The BEST answer will NOT be the same for all APPLICATIONS!

Since I do not know each and every Heath/Zenith reader's application(s) (I do not really even know all of my most important applications). I must try to cover all the possible bases. The main answer will be that it boils down to a TRADE OFF nearly every time.

Where shall I start? Well I have been telling the readers how important the CONFIG.SYS file would be. Therefore, that is where I am going to start. All MS-DOS Version 2.x users already have this CONFIG.SYS file available, so it will not cost any money. It will require some time to decide on its ultimate configuration as we will find as I proceed. There are two commands that I will delve into:

1) BUFFERS = n
2) DEVICES = MDISK.DVD

I will discuss the command, BUFFERS = n, first. I hope that the readers will remember from last month's article, a BUFFER is a block of RAM used to temporarily store one disk sector! The H/Z-100 buffer occupies 528 bytes per buffer and the H/Z-100-PC occupies about 1040 bytes per buffer. Otherwise, everything that I discuss about BUFFERS applies equally to both types of computers.

By varying the disk buffers we will be able to significantly SPEED UP the performance (through-put) of the computer. The design of the logical structure of the disk, how data is stored on a disk, requires some strategic decisions. These decisions will vary for a hard disk drive vs floppy disk drive. Basically, there is ONE set of characteristics that will produce the BEST overall result for each drive type for a particular application. Of course, we know that it would not be practical to vary the buffer size for every application, but if the user has ONE or a FEW applications that should be emphasized then this approach would be practical. If the user has a lot of different applications that would happen to require widely differing buffer sizes, it would become necessary to find the best balance for the buffer size that will work best with the most applications using the type of disk and the amount of memory that would be available at that time.

What we will be doing is adjusting the buffer to find the most efficient disk space usage (and how much wasted) vs how much disk I/O processing would have to be performed. This requires consideration for disk operation overhead and how much memory storage space should be allotted for disk buffers to obtain the best through-put for the application. I guess that sounds complicated but it will become clearer as we get into the trade-off discussion. My trade-off decisions have changed in the last few months because the cost of RAM chips have dropped dramatically and we cannot make our decision without giving memory (RAM) cost and availability some consideration.

Therefore, the efficient overall performance (through-put) of the computer depends, in part, on using the optimum sized disk buffer to avoid excessive I/O processing overhead time. This must be weighed against the amount of memory (RAM) used and thus not available for the user program and its data. That is the trade off decision! Unfortunately the disk buffer cannot be adjusted automatically. Fortunately, the MS-DOS Ver.2.x puts the disk buffer under user control, if the user will take the time to learn how to set the buffer to the most reasonable value. The default value IS a useless small buffer for all hard disks and memory sizes as I have found from the testing that I have done. The default value is not as far off with floppy disk usage. This problem does not get much attention in the MS-DOS documentation, so not many users realize what an important factor it is to achieve maximum through-put!

I will cite a couple of examples at this point in the article, but I will discuss the many user applications I have tested in the concluding portion of this subject:

1) I varied the BUFFERS from 2 (default) up to 50 (which uses nearly 25K or 50K of RAM depending on whether the H/Z-100 or H/Z-100-PC is being used in the testing since their default buffer size equals either 528 bytes or 1040 bytes). My H/Z-100 has 448K of RAM and a 20-megabyte hard disk while the H/Z-100-PC has 640K of RAM and a 10-megabyte hard disk. A program compiler showed a speed improvement of about 20% when the BUFFERS equaled 15 with the H/Z-100 and equaled 10 with the H/Z-100-PC in place of the default 2. Beyond these buffer sizes the speed up was not noticable.

2) With a word processor reading and writing a short two page single-space text file, the time was 15 or 17 seconds for the two computers and the "default 2" buffers. The time went down steadily as additional disk buffers were added until 50 and 30 buffers were in use, the time was about 3 seconds! This improved through-put was about 1/5 of the original time. I would call that dramatic!

This demonstrates that through-put varies from application to application when we change just one of the parameters we will be discussing under this subject. The conclusion that must be drawn is that the user must test the computer with the important applications to find the best through-put. Most readers will not have time to test every program that they use. I will test sufficient number of programs so that hopefully my report will include the ones being used by the readers or one that is nearly the same as what is being used. I am going to ask for the reader's help with this also at the end of this article! One other thing that I learned from my testing is having too many disk buffers with some applications actually degraded the through-put as well as wasted memory! So, I will NOT conclude that the answer is to use as many disk buffers as possible with the memory available.

If the readers have been reading the vendor's literature about floppy disk drives, hard disk drives, and controller for the two; they will find that the specifications for all three would lead one to believe that one make is BETTER than another! I have found by testing that when the optimum BUFFER size is used for the application, the through-put between the different hard disks and the different hard disks' controllers is nearly impossible to measure. I did find that there was a significant difference between the older and newer floppy disk drives and controllers. Here again when we narrow down the discussion to the H/Z-100 and H/Z-100-PC computers with their newer built-in type drives the difference will not be measurable.

The 10-megabyte hard disk drives require a smaller number of disk buffers than the 20-megabyte drives for the same application. A number of possible reasons could be found for this but that is not the subject of this article. A little side discussion is in order here. The first personal computers were equipped with the 10 megabyte hard disk to reduce overhead I/O processing time. This decision was made at a sacrifice of efficient storage of data. That cost, on an average that I found, was about 2,000 (2K) bytes of disk space for each file put on the disk. This amounts to something like 15% of the entire disk space with a nearly filled hard disk. In other words its usage was intended for working storage rather than archiving storage. This type of decision increases the through-put because the disk buffer was fairly large and therefore the number of read and write processes to the disk are reduced. It also reduces the wear-and-tear on the disks by the same reductions in the number of accesses.

With a 20-megabyte hard disk drive, the so called wasted space is even less important. The fact that only 17 or 18 megabytes of disk storage is available is not very important! The important factor would be through-put for most applications. Thus, a trade-off of efficient disk storage vs increased output and life of the computer system has been made! This involves RAM as well, as I will be discussing shortly.

Let me summarize a little. The disk BUFFERS reduce the I/O processing keeping in memory (RAM) copies of disk data that may be needed in a

Continued on page 105

CP/M

New Spectravideo Portable Computer Features 10 Megabyte Hard Disk, 128K RAM, and Bundled Software

Spectravideo Inc.'s new Bondwell 16 portable computer, featuring 10 megabyte hard disk drive, 128K RAM memory, built-in voice synthesizer and bundled software will be available for retail deliveries beginning in May, 1985. The computer was first unveiled at the Winter 1985 Consumer Electronics Show.

Carrying a suggested retail price of $1995, the Bondwell 16 Z80A microprocessor based computer also features a 9" non-glare monitor, 91 key detached fullstroke keyboard, with a separate numeric key pad, built-in modem, and a 5¼" floppy disk drive.

Equipped with the upgraded CP/M 3.0 operating system, the 30-pound computer is better able to utilize its 128K RAM memory in the application of the five leading business software programs bundled with the system: WordStar, MailMerge, CalcStar, DataStar, and ReportStar.

"The Bondwell 16 is without a doubt the lowest priced, high performance, 10 megabyte disk drive computer on the market," according to Spectravideo President Christopher Chan. "We're very confident it will be well received at retail."

The Bondwell 16 is the third portable computer introduced by the newly reorganized Spectravideo. It joins sister models Bondwell 12 and Bondwell 14 in the company's new small business product line. The company, which is headquartered in Fremont, CA, continues to market its Spectravideo line of home computer products, joysticks, and accessories.

For more information contact Spectravideo, Inc., 3300 Seldon Court #10, Freemont, CA, 94539, (415)-490-4300.

Mention that you read it in the Computer Shopper. ●

Spectravideo's New CP/M Computer

Ring That Bus

by L. Van Delray

Unwanted ringing has had a bad name since Quasimodo did his thing with the bells of Notre Dame.

This column will discuss ringing — no not bells — but a digital circuit. What, you didn't know that a digital circuit or a computer bus could ring? Well it can and often does, and when the ringing occurs "too loudly" digital data goes berserk.

Don't stick your ear to the digital device enclosure to listen for this phenomena as it can be detected only with an oscilloscope. It is called "ringing" because the electronic waveform produced looks very much like that produced by a metal bell when it is struck.

Ringing is present in one degree or another in every digital electronic system because steep-edged waveforms are used in these systems. Ringing can also be found in analog systems, where it makes its presence known by altering steep-edged waveforms such as those from percussion and stringed instruments. In these cases, the steeper the edges of the signal, the greater the possibility of ringing.

If you want to check your system for ringing, connect an oscilloscope to almost any point where a stream of steep-edged (fast rise and fall time) waveforms exist. The squareness of the displayed waveforms is a function of both the "bandwidth" of the scope being used, and the performance of the system being viewed.

A perfect square-edged waveform is shown in Fig. 1A. By the way, if you examine a *perfect* square wave with a very high bandwidth oscilloscope, all you would see are the top and bottom flat portions of the waveform, as the rise and fall times would be so fast that the scope would not display them. This is due to the fact that a perfect square wave would require unlimited bandwidth to pass all the components, while even an expensive broadband scope has limited response.

Now, back to the real world. In your system, the scope would probably show a reasonably good square wave, but, there would most likely be a very low amplitude, rapidly decaying ac signal following both the leading and trailing edges of the waveform. Although minor ringing will not have any effect on the digital system, excessive ringing can produce erratic operation. Let us see why. Before we go any further, we must point out that digital ICs *do not* work with logic signals, they work with *voltage changes*, and, *they do not care where these voltage changes come from.*

In the most common logic, TTL, when a signal drops below 0.8 volt it indicates a logic-0, and when the signal rises above 2-volts, a logic-1 ensues. The reason for these levels is because of the electrical nature of the silicon technology used to fabricate these ICs.

TTL chips are designed so that a logic-0 is 0.8 volt while a logic-1 is 2.4 volts. This ensures that the logic fulfills the signal requirements as shown in Fig. 1A.

Now, let us assume some ringing as shown in Fig. 1B. Note that (in this case) the leading edge exceeds the TTL logic-1 minimum level and the trailing edge drops below the logic-0 level of 0.8 volt.

Note that in Figure 1B, the first cycle of ringing following the leading edge causes the level to drop below the 2-volt level and into the questionable area. This means that the logic may remain at logic-1 or it may drop to logic-0. Note also that the second ringing cycle raises the voltage above the 2-volt level, so that if the signal had dropped to logic-0, it would now go to logic-1.

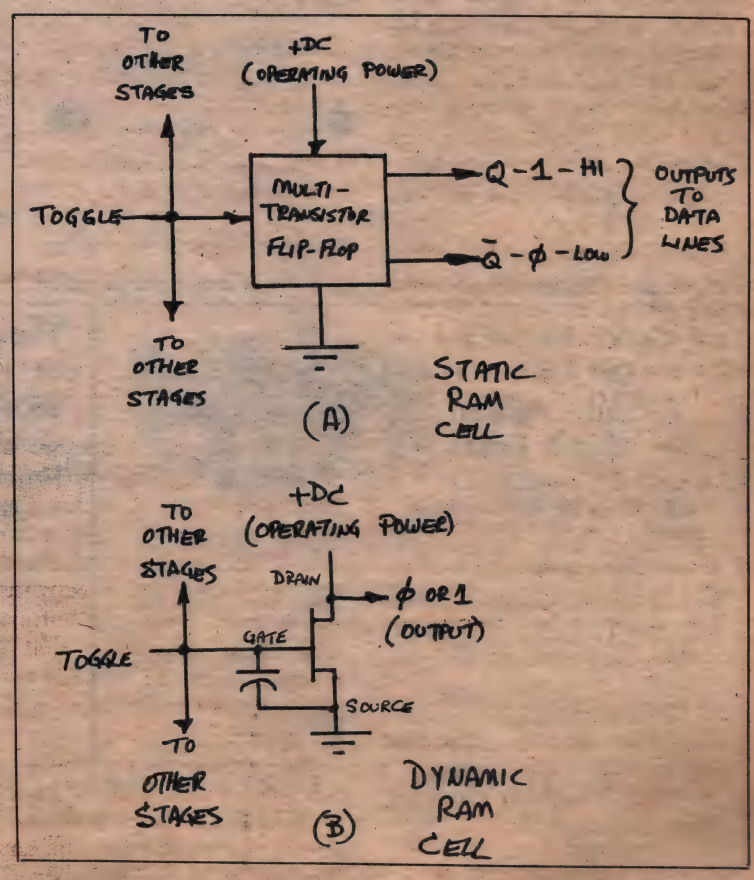
If this did occur, then the logic being triggered would have made *two* counts on basically one input signal. Obviously if the following ringing cycles also pop back and forth across the questionable line, more erratic counting can take place.

Note also that the same problems can occur with the ringing on the negative-going trailing edge of the waveform.

Fortunately, in most cases, the ringing waveform is so slight that logic crossings do not occur, and the oscillatory waveform dies down very rapidly.

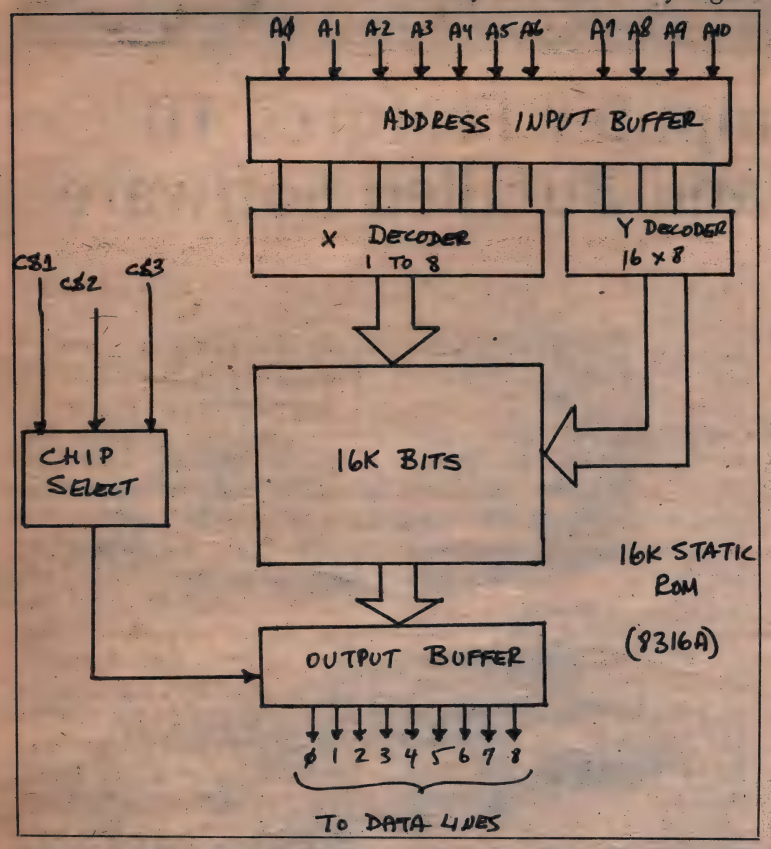
Ringing in a digital system is usually generated by a square-edge waveform (rapid current change) either passing through an inductor, or "reflected" back along the lead that carried it due to poor impedance

Continued on page 58



Ring That Bus Continued from page 57

matching at the ends. Obviously, bus structures that minimize ringing are "faster" as they can handle very high-speed square waveforms.



A signal must have three things. First, it must have a source — usually the output of one of the digital stages in the system; second, it must have a place to go — usually one or more digital stages in the system or a peripheral connector, and, thirdly, it must have a road to travel along — usually a slender copper trace or wire.

Engineering rules tell us that when the impedances of the source, the transmission medium, and the receiver are closely matched, then all the signal energy will be absorbed. However, in the real world digital devices are not perfect. Impedances may vary somewhat and thus there is always a little energy not absorbed.

This remaining energy is reflected back to the origin, where hopefully it will be greatly attenuated so as to essentially disappear. However, if some of this energy is not absorbed, it starts back down the road it just came from. This bouncing back and forth will continue until all the energy has been expended.

You might wonder since the original signal was a square-edged waveform, why does a ringing signal look like a decaying sine-wave?

I must point out that a square wave is created from a basic sine wave of the desired frequency, that has been combined with a number of odd harmonics of proportional amplitude as shown in Fig. 2. Note that the more odd harmonics used, the "squarer" the resulting pulse becomes. Thus, a "pure" square wave would have an infinite number of odd harmonics — a situation hard to come by.

To give you an idea of the frequencies involved, assume a pulse rate of 1 MHz. This means that a 1-MHz sine wave is used as the base, and the odd harmonics added. If you consider 7 odd harmonics, you are looking at 7 MHz, nine harmonics means 9 MHz, etc. Also, keep in mind that it doesn't take much capacitative reactance to attenuate signals of these frequencies.

If you take a close look at the wiring (pc traces or real wires) that interconnect a typical electronics circuit, you will find many "invisible" capacitors, resistors, and inductors.

When these invisible components are coupled with the inputs and outputs of the various ICs (also containing invisible capacitance), it causes some of the higher frequency harmonics that form the square wave to be attenuated. The more harmonics that are removed, the closer to the original sine wave the waveform becomes. Thus, what started out as a square wave could now appear "sine-ish."

Termination is like dropping a ball on the floor. If the floor is made of sufficiently soft material the ball would hit and not bounce. However, if the floor were made from a harder material (termination not complete), then the ball will bounce. Each time the ball bounces, it loses a little more energy until it bounces no more. In this analogy, the amount of floor softness (termination) determines the amount of ball bouncing (ringing).

Fortunately, most digital systems are properly terminated so that in most cases ringing is minimized. ●

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CHECK provides easy maintenance and debugging of dBASE II command files by identifying improper nesting of conditional commands and indenting for each additional nest. When a nesting error is located, you are provided with the correct logical closing based on the last conditional command being processed. Execution speed may be improved by optionally removing comments, blanks, and tabs from your program. Leading command words are reduced to four characters and may be output in upper or lower case. File size is further reduced by eliminating the continuation symbol ';'. Extensive parameters may be passed in the command line for ease of use and flexibility from a system prompt. Batch processing is accomplished by using a 'CHECK' file containing the desired commands. Results may be displayed on the screen or suppressed to decrease execution time. Errors may be placed on the screen with pauses or sent to the printer for unattended operation. 'Quick' check in memory at speeds up to 5000 lines per minute on a 8mhz 80186 and 8" floppy drives. As an added feature, bit seven and WordStar hyphens may be stripped from corrupted files. Cost is $49.00.

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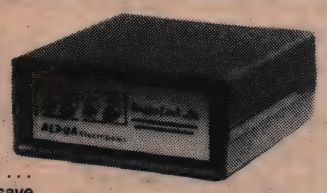

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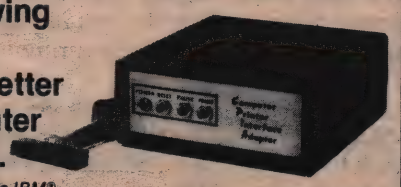

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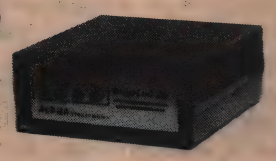

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TIMEX-SINCLAIR

Timex Sinclair Survival Column

by Mark L. Fendrick

Happy Birthday to us... Happy Birthday to us! This column marks the first anniversary of the Survival Column here in Computer Shopper. Twelve months ago we were just getting over the shock of Timex's shattering announcement, SYNC and Timex Sinclair User ceasing publication, and many of our favorite support companies giving up on the Sinclair computers. Only Stan Veit, Computer Shopper editor, recognized the fact that thousands of Sinclair computerists now needed a place to turn more than ever, and this column was born. From all of us, Stan, thanks.

When Timex pulled the plug, probably the first thought that came to many of us was, "What about the Microdrives?" Especially to those of us who suffered with the 250 baud cassette interface of the ZX-81 and T/S 1000 computers, the thought of low cost, fast, dedicated mass storage devices was an overpowering consideration in the purchase of the new T/S 2068. We had read about the Sinclair ZX Microdrives for the Spectrum, and many of us had actually seen a prototype Timex microdrive running at the BCS Timex Celebration in October, 1983. True, the T/S 2068 had an improved, faster cassette interface but it still was slow and inconvenient as compared to the disk drives the other computers utilized. In fact, the T/S 2068 even has a number of BASIC commands included specifically for the operation of the proposed microdrives.

While the Timex microdrives are not to be, there is now available a microdrive system for the Sinclair computers. Notice that I did not specify the T/S 2068, since the A & J Microdrive Company (1050 East Duane Avenue; Suite I; Sunnyvale, CA 94086; (408) 732-9292) has a unit for each of the Timex/Sinclair computers. Actually, they are not new to this market since the microdrive for the T/S 1000/1500 has been available since well before the introduction of the T/S 2068 (or 1500 for that matter), however, with the introduction of the model 2000 the A & J Microdrive Company has gained widespread recognition in the Sinclair community. This review is based on the model 2000 (for the T/S 2068) but I will mention some of the features of the T/S 1000/1500 model as well.

The basic starter kit consists of the interface, one microdrive, an owners manual, five micro wafers - one of each available size - and one wafer organizer - a folder which holds up to 16 wafers. Set up is extremely simple, all you do is attach the interface to the T/S 2068's expansion bus. It has a 64 pin connector and through connector. You will probably want to have this closest to the computer if you use any other add-ons as most others (T/S 2040 printer, modem, etc.) have a shorter connector. You will notice a short connector at the top of the interface marked PRINTER PORT. This is a parallel interface which, when the proper cable and software are added, will allow you to run a full size printer. The two remaining ports on the rear of the A & J interface are marked DRIVE 0 and DRIVE 1. The starter kit has the drive properly connected to the DRIVE 0 port, and when you purchase a second drive it goes into the DRIVE 1 port. The drive itself is at the end of an 18 inch cable, long enough to place the drive in a position convenient to your set up. The drive measures seven inches X three inches X five inches, is matte black, has a slot on the front in which the micro wafer is inserted and two red lights which indicate that the drive is working and/or writing data to the wafer. No external power supply is necessary since the drive(s) take the power directly from the T/S 2068 expansion bus. (Note: This is not the same drive as is used for the T/S 1000/1500.) The wafers measure 2 5/8" x 1 3/4" x 1/8" and come in five sizes:

Tape Length	Capacity
10 feet	14K
20 feet	28K
35 feet	49K
50 feet	70K
65 feet	85K

The access time is dependent upon where on the tape you happen to be when you start LOADing a file.

The current version (2.0) has the entire operating system in the TIMEX EX-ROM thus leaving available all memory which would be available without the microdrive(s) attached. The earlier version had part of the operating system at the top of RAM and reset RAMTOP down to accommodate it. There were also situations where problems existed due to the fact that older model T/S 2068s have a slightly longer initialization period. Version 2.0 eliminates these problems, and allows use of the full RAM for program use.

Once you have attached the system, you only have to turn your computer on to activate the Stringy Operating System (SOS). The system patches into the audio cassette routine (without disabling it) so that all of the commands (SAVE, LOAD, VERIFY) are the same as with a cassette with only minor differences. When using any of the SAVE commands, the first character of your file name must be @. This is a flag which indicates that the file will be written to the microdrive rather than to cassette. The second character must designate a file number which corresponds to the position on the wafer. The SOS SAVEs the files in numerical order, one after the other. Even though this must be a single digit designation, the user's manual describes how to SAVE well over one hundred files on a wafer, provided there is room on the tape. Finally, a comma followed by an actual filename of up to seven characters directs the SAVE to the microdrive. The proper form to SAVE a program named "test" to the first file position on a wafer would b;

SAVE "@1,test"

This can be issued as either a command in immediate mode, or as a line in a program.

You will notice a few differences once you start the SAVEing procedure as well. Unlike the normal cassette SAVE, you will not be prompted to Start tape then press any key since there is no need to start the microdrive. Instead, the microdrive immediately starts whirring, and a red light goes on as it searches for the correct spot to SAVE the file. (You cannot SAVE a #2 file unless there is already a #1 file on the wafer.) When it finds the right spot, the second red light goes on as the file is written to the wafer. You will also notice that the SAVEing pattern you are used to seeing on the border does not occur. When it is done, the drive stops, and, if you are running a program, execution continues just as it would during a normal cassette SAVE.

LOADing a file is even simpler. Neither a file number or a comma is necessary. In fact, you must not use them. To reLOAD a file just place the @ flag immediately followed by the filename. In the case of the earlier test file, the form the LOAD statement would take is;

LOAD "@test"

The VERIFY command works in the same manner as the LOAD command. Unlike the normal cassette command, however, you cannot use a null filename to LOAD the first file found. Since the T/S 2068 will continue to list all file names as the headers are read, if the worst should happen and you forget what you named the file, you can check it against the listing as it appears on your screen. To avoid this you should pencil in the file names on the label included with each wafer.

Most commercial cassettes can be transferred to wafers and the tape stored as a master copy. If you are able to use the BREAK command to stop the program, you will have no problem making the transfer. Machine code routines require that you know the starting address and length. There are methods you can use on programs which you are not able to BREAK into, but since these methods might be used to make pirate copies, I will not print them here. In cases where this is the situation, try contacting the publisher (or distributor) and you may find a solution. If you are unsuccessful in this attempt, send the name of the program and its publisher to me with a SASE and I will try to find an answer to your problem.

The major drawback to this system comes about with programs which don't utilize the normal SAVEing routines, but rather rely on their own machine code routines to accomplish the SAVE. My personal familiarity with this is a result of using MSCRIPT as my wordprocessing software. It was quite easy to place the MSCRIPT loader, logo and machine code onto a wafer, but the program uses its own SAVE routine which cannot be routed to the microdrive. I am interested to hear if any of you who have encountered the same problem have found a way to solve it. If so, write to me (c/o COMPUTER SHOPPER; P.O. Box F; Titusville, FL 32781) and let me know what your solution is so that I may share it with others having the same problem. Also, if you know of any other programs which have similar problems, let me know and I will print any solutions I am able to obtain.

Be aware, however, that the A & J Microdrive does not utilize the Sinclair microdrive commands found on both the Spectrum and the T/S 2068 (FORMAT, CAT, ERASE, MOVE, OPEN# & CLOSE#). Except for ERASE though, all of these commands have their equivalent procedures in the SOS, and while you cannot ERASE a file, it can be overwritten. This brings me to a word of caution. If you SAVE a file (or a program) which you plan on enlarging and reSAVING you must not SAVE any other files after it as these files will be overwritten by the enlarged file, as it will now require more of the tape.

The T/S 1000/1500 version works in a slightly different manner, but SAVEs your data at the same rate that the model 2000 does. It is invoked via USR calls, and has two versions depending on how much memory is available to LOAD the machine code operating system. The condensed version, for use when extra memory is at a premium, gives the user access to SAVE PROGRAM, LOAD PROGRAM, RETURN TO BASIC & CERTIFY. If you have 1K available, you can use the full version which, when the USR call is invoked will present you with this menu:

Continued on page 60

Timex Sinclair
Continued from page 59

1. GET WAFER DIRECTORY
2. LOAD PROGRAM
3. SAVE BASIC PROGRAM
4. INITIALIZE WAFER
5. RETURN TO BASIC
6. LOAD BY NUMBER
7. SAVE MACHINE PROGRAM
8. SELECT DRIVE
9. COPY WAFERS

The wafer directory will show you what programs are on the wafer as well as showing how many bytes are still available to store data. Selection 7 allows you to SAVE and self-start machine code programs.

As with the model 2000, you must be able to stop the execution of the program to make use of these drives. The USR calls may be made in either command mode, or added to the program itself. With machine code programs you will need to do the starting address of the program, its length & the entry address.

When you consider the greatly improved speed of this system as compared to the standard cassette system, you see the usefulness of the system. (32K would take almost 12 minutes to LOAD from tape, and about 45 seconds to LOAD from the microdrive.)

Why purchase the A & J Microdrive system when there are now floppy disk interfaces available for the Timex computers, and interfaces are starting to appear which allow you to use the Sinclair Interface 1 and ZX Microdrives on your T/S 2068? First of all the price. When you add the cost of the floppy disk interface, power supply, drive and case it comes to between $400.00 and $500.00. The A & J basic kit which includes everything you need sells for about $150.00 for the T/S 1000/1500 model, and $200.00 for the T/S 2000 model. The Sinclair microdrives will not work on the Timex operating system, but require some form of Spectrum ROM to operate. This causes you to be unable to use much of your T/S 2068 software with the microdrives. Also, availability of the cartridges in this country is suspect at the moment so you must order from England. The A & J drives are available for a number of computers (including the Commodore 64) and the wafers are easily obtainable from a number of sources here. The A & J units do not operate in Spectrum mode at the present, but the most recent flyer from the E. Arthur Brown Company says that this may be remedied shortly, producing a system which will operate on just about any program you can run on your T/S 2068.

Speaking of Spectrum mode I have recently received the ROMSWITCH from G. Russell Electronics (RD 1; Box 539; Centre Hall, PA 16828; (814)364-1325). This is a very clever device which gets permanently installed within the case of your T/S 2068 and allows you to switch between either Timex or Spectrum operating systems. Many dealers who sell the ROMSWITCH offer to install it for a slight fee, but you should consider doing it yourself as it is very simple and can be accomplished in a matter of minutes. To install the device, you must remove the screws which hold the case together and carefully lift the top off. The instructions clearly illustrate where the Timex ROM is located, and you remove it from its socket and insert it into the empty socket in the ROMSWITCH. The entire device then gets placed in the socket from which you have just removed the Timex ROM. You replace the top of the case and stick the self-adhesive magnetic switch on the keyboard to the right of the 0 Key. And that's all there is to it. You are now able to simply move the switch from the Spectrum to the TS 2068 position to choose the proper mode. The ROMSWITCH itself consists of a small board with two IC holders. One contains an issue three Spectrum ROM, the other will contain the Timex ROM which you remove from your computer. A magnetic switch at the top of the board selects the appropriate operating system. The external keyboard switch is just a plastic channel in which a magnet travels. As I said, it is quite simple to install, even if you have never opened your case before (I hadn't) and are unfamiliar with electronics (I am). From the time I started to remove the screws until I was running a program in Spectrum mode was under five minutes! The only tool required is a screwdriver. The current version has been improved for even more Spectrum compatibility. Owners of the older model should contact G. Russell Electronics for their upgrade kit if necessary. Remember to mention COMPUTER SHOPPER and this column whenever you contact any Sinclair dealer.

G. Russell Electronics also produces the Winky Boards which fit inline between your cassette player and your Sinclair computer and improve your LOADING of programs. The Winky Board 2000 will work on all models of Sinclair computers. Using it, I have been able to LOAD a number of programs which would not LOAD previously no matter what I did. They also produce a model which works on the Commodore 64.

To reply to those of you who asked about the inverse screen modification which I mentioned that I made to my ZX-81 a few months ago, I have discovered a source of the necessary module which, when soldered inside your computer, will invert both the program area as well as the border. For information contact the E. Arthur Brown Co. (3404 Pawnee Drive, Alexandria, VA 56308, (612) 763-6393).

In the upcoming months you can look forward to looks at the Sinclair bookshelf, Forth, Pascal, the QL (I hope) and more for the Sinclair computers. (Don't expect to find much at local computer shows. I was at the Ken Gordon Computer Show in NYC this morning and the only booth - of more than 150 - which recognized that we still exist was, of course, COMPUTER SHOPPER.) As always, I will continue to try to respond to your questions if you enclose a SASE. Our second year promises to be even better than the first so stick around. ●

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Public Domain Software

Continued from page 38

```
          Ver CPC-12.4A1 2 disks
          for advanced users
          as of ..... 3-17-85
Disk #19 - Utilities.III
          Last Release:  9-19-83
Disk #20 - PC-DIAL (IRD)
          Last Release:  1-16-85
Disk #21 - Utility Seminar
          Last Release:  10-29-83
Disk #22 - PC-WRITE (*50 wp)
          Last Release:  1-21-85
Disk #23 - GENERAL I
          Last Release:  2-19-84
Disk #24 - STATISTICS I
          Last Release:  4-16-84
Disk #25 - Games&DOS 2+
          Last Release:  5-21-84
Disk #26 - PC PIC GRAPHICS
          Last Release:  6-18-84
Disk #27 - Miscellaneous III
          Last Release:  7-16-84
Disk #28 - Utilities. IV
          Last Release:  8-20-84
Disk #29 - Disk Catalog
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Disk #30 - Utility Seminar
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Disk #31 - HOLIDAY I  GENERAL
          Last Release:  12-17-84
Disk #32 - Misc IV
          Last Release:  12-17-84
Disk #33 - PC-CALC Ver 2.0
          Last Release:  1-17-85
Disk #34 - 123 Tax 84 & Misc
          Last Release:  1-28-85
Disk #35 - 3 by 5
          Last Release:  2-18-85
Disk #36 - File Express
          Last Release:  2-18-85

Utility 1-2-3
Utilities for LOTUS 1-2-3

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Disk #0(Zero)
List  of SW LIB programs &  general
information

CPC
Club bylaws,  constitution and  tax
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```

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To order disks by mail... Send:

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Contributions are accepted by the SW LIB for CAPITAL PC's software library, the disk of the month and for use on the SW LIB PC-HOST system.

Comments/questions should be directed to: Attn: Mel Cooperman, Directory at the above address.

```
Here's the newest releases
CPCUG 034,035,036

CPCUG 034
Income Tax time  for Lotus 123 users.
sorry no tax extension forms....

README
THE FILE YOU ARE READING.

TT_1040  WKS    80128
1984 TaxTime (without Sch C,E,F,R)
TT_HELP  WKS    16640
Doc file for TT_1040.WKS

123PREP  EXE    30208
123PREP  DOC     8704
Convert ASCII files to 123 format
and DOC file for 123PREP.EXE

123RNGE1 BAS     8342
Display range names from
spreadsheets

ACRS     WKS     6528
Accelerated depreciation calculator

AMORT    WKS    13056
Loan  amortization  (monthly-max  5
yrs)

CARCOST  WKS     6272
Car operating expenses

FOR_NEXT WKS     3027
FOR_NEXT loop using macro commands

IRR      WKS     7552
Internal rate of return

LEDGER   WKS    16640
Checkbook ledger - multiple options

PAD      WKS    29312
Notepad for phone #s, names, etc.

STATS    WKS    10112
Descriptive statistics

HANGROBO WKS    16384
Hangman game (Good demo but slow)

SOFTWARE.DOC    48792
What is on disks 6-34 CPCUG lib
```

CPCUG 035

Ever blue sky your ideas into a tape recorder or a notepad? Here's a psuedo index card system called 3 by 5... yes an old fashioned index card reminder (remember your days of public speaking??) It reminds me of Think-Tank.

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e. Cataloging and cross-referencing research notes.
f. Presentation preparations

```
3BY5.EXE  The main 3by5 program.

SAMPLE1.3X5  \
SAMPLE2.3x5  \   Sample files
SAMPLE3.WP   /
SAMPLE4.WS   /

Four  companion index files for the
sample files.
SAMPLE1.MAP
SAMPLE2.MAP
SAMPLE3.MAP
SAMPLE4.MAP

Batch  file  to  print  all  3by5
```

Continued on page 69

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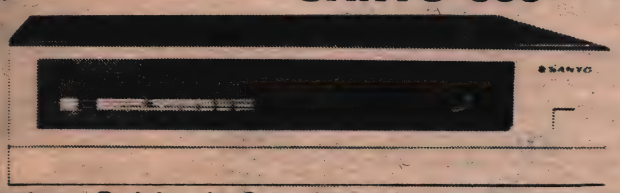

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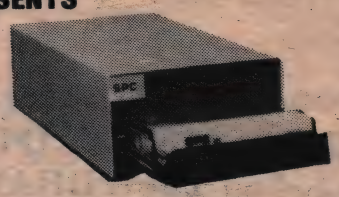

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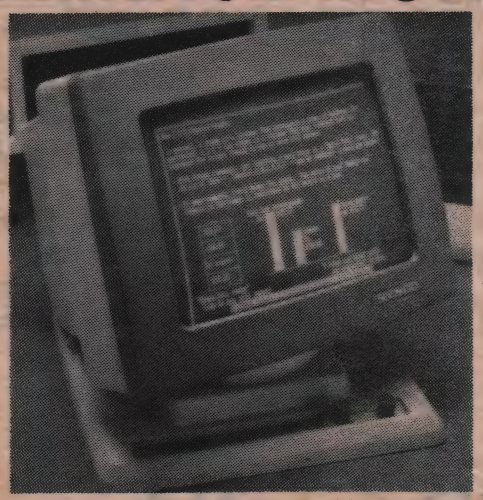

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Smartcom II
Continued from page 37

reach in the back of the modem and adjust the volume to any level, your program must be able to adjust the volume itself. The first time I used the modem I overlooked this feature and when the speaker came on I thought I was sitting front row at a Cindi Lauper concert. Yes, Hayes still has the loudest speaker in the business...

Another minor difference lies in the external power transformer. The transformer used by the 300/1200 modems is identical in appearance to the unit used by the Hayes 2400. The difference lies in the fact that the 300/1200 transformer uses 13.5 volts and the 2400 used only 8.5.

One major enhancement implemented in the new series of Hayes modems is the ability of the modem to differentiate between a ring and a busy signal. Hayes used to rely on a predetermined time-delay once dialing concluded, to look for CD (carrier detect). If you reached a busy signal, the modem would wait for whatever time it was told to then simply abort as though it got no answer.

Performance

I must confess that I was very skeptical of the 2400 baud modems. Problems that I encounter on a routine basis with 1200 baud had me convinced that the telephone lines would not support the higher speed. I was wrong! Finding a suitable test for the modem was the first problem; it required me to communicate with someone else that also had a 2400 baud modem on the other end. Since I couldn't find anyone, I had to do the next best thing; I called Tymnets node in Miami, which is one of the few Tymnet nodes currently supporting 2400 baud. Once connected, I entered their online information directory (it's free) and dumped list after list of phone access numbers and information bulletins. I didn't receive a single bit of line noise and didn't detect any dropped bits.

For the acid test, I decided to call the Tampa, Florida node of Tymnet. Not only does it also support 2400 baud, it's in an area I usually have great difficulty in communicating at 1200 baud. Once again, to my surprise, not a single problem.

It made a believer out of me. The 2400 baud not only worked, but worked well. If your modem needs were limited to dumb terminal ASCII displays, you will probably find 2400 baud too fast to read; I often have difficulty keeping up with 1200 baud.

Where the modem would shine is when making large file transfers or when capturing large amounts of data not taking place in an interactive environment. If you enjoy downloading programs from bulletin board systems or routinely send large manuscripts across the country, the 2400 baud is THE way to go...as long as the other guy has one!

Is 2400 Baud the Answer?

Before you jump out and buy the Hayes 2400, make sure you are willing to give up software compatibility. Whether you operate at 300 baud or 2400 baud, your Hayes 2400 will need Smartcom II (unless you can modify your existing program to send the necessary command codes to the modem). If that represents a problem you would do well continue using your 1200.

Another consideration in switching to the 2400 baud modems will surface once the information services extend their current 1200 baud surcharges to cover the 2400 baud mode. Many will find it far too costly to access time share services at the higher speed. While most of the people I know have 1200 baud modems only a handful actually access information services like CompuServe at 1200 baud because of these surcharges.

If, on the other hand, your communications require extensive long distance calling, the payback period on an $800 modem would be short. Based on Value Pack rates of $10 an hour, you would pay for your modem after only 80 hours of modem usage. To some corporations, that represents less than a month of usage.

Smartcom II (Ver 2.1)

To coincide with the release of the Hayes 2400, Hayes released version 2.1 of Smartcom II. While it appears almost identical to earlier versions, it does provide the additional software support required of the 2400 baud modems as well as adds a few new features.

The newest version of Smartcom appears to be completely compatible with the files created with earlier versions of the software. If you already use Smartcom and

Continued on page 66

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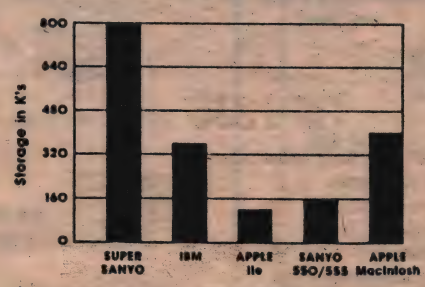

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Compaq's Deskpro
Continued from page 37

software control or, at any time, by manual keyboard intervention. The current status of the setting is indicated by a light on the front left surface of the system: green for the native 8086 mode; red for the common mode.

The video display of the Deskpro utilizes the same Compaq proprietary process found in the Portable and Plus computers that allows a single monitor to display both monochrome quality text and graphics. This approach does not require the use of more than 1 accessory board and monitor (as do the IBM'units). Compaq offers two monitors, a green and an amber, within the Deskpro configurations. Both models are 12" and display characters formed by a 7x9 dot-matrix within a 9x14 cell. We find the Compaq text presentation to be the equal of the IBM monochrome monitor and superior to other PC compatibles.

In designing the keyboard, Compaq chose to make minor improvements (LEDs to indicate "on" status for "CAPS" and "NUM" locks) while maintaining a format compatible with the PC keyboard (with all its difficulties). The keyboard connects in the front with the same type of connection as the PC (and can therefore be replaced, if desired, by one of the enhanced third-party keyboards) and can be tucked under the computer if the optional "Desk-Saver" stand is utilized. The keyboard has the same softer typing feel than the IBM keyboard that the earlier Compaq models have. We find this difference to be neither an advantage nor a disadvantage.

One of the most attractive things about the Deskpro is the availability of a BUILT-IN hard disk backup (a feature gravely lacking in the PC/XT and PC AT). The use of the built-in tape cassette allows the backing up of the 10Mb disk in approximately 18 minutes (after the target cassettes have been initially formatted which takes approximately 40 minutes). Built-in backup is, in our judgment, the only responsible method of insuring the safety of data maintained on hard disks (in our consulting business, we have been constantly exposed to businesses who have "been too busy" or "forgot" to back up to floppies before the head was damaged by static electricity or power failure. It is often equally hard to convince these people to install a $1,000 external backup because "IBM obviously didn't think it was needed or they would have put it in or, at least, recommended it").

The dual floppies, 10Mb hard disk and tape cassette backup are all contained in the same shock-mounted disk drive

Compaq's Desk Top Computers

compartments that made Compaq's portable computers practical. Recently, Compaq has announced a 30Mb hard disk for the Deskpro. This 30Mb drive, which will also be an internal device and will be backed up by the tape system, is obviously aimed at insuring that the top of the Deskpro line is considered competitive with the PC AT (Similarly, Compaq announced an 8087-2 Math Co-Processor for the Deskpro to counter the availability of the 80287 for the AT).

The Deskpro system contains eight IBM PC/XT compatible expansion slots (one short and seven long). Of these slots, the floppy disk/printer controller board and the video monitor board take one slot each in all models. The fixed disk controller takes a long slot in Models 3 and 4 while the asynchronous communications/clock board uses the short slot in Models 3 and 4. This utilization leaves five long and one short slot available for additional peripherals in Models 1 and 2 and four long slots available in Models 3 and 4.

Can we find anything at all negative about the Deskpro? Yes, there is enough space in the disk I/O chassis between the upper and lower compartments for the system to "eat a disk" if the operator is not paying close attention (this opening is placed at about the same level as the opening of the full height drives on the IBM PC). We lost a copy of "Spotlight" in this fashion (the problem is eliminated by taping over the opening (thus "burying our "Spotlight" disk forever).

Other than this difficulty, we found no significant pro-

Continued on page 66

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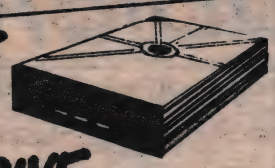

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Smartcom II
Continued from page 63

have created auto logons, macros and have custom installed all of the communications parameters, you'll find that to be quite comforting! If you were purchasing this program for the first time, you'd have the fun of installing the parameters and configuration tables for your system. How difficult is it? Well, lets take a look at the information needed.

Configuration

If you are a newcomer to personal computers, you'll love the configuration section! Don't panic yet, most of the features consist of standard default settings already installed. For those that seem a little unfamiliar, the manual adequately explains most of it pretty well. Also, at any point you can press the F2 key for additional on-line assistance. Here is a reprint of the actual configuration screen:

Configuration Diagram
On Page 69

Most of the printer settings are unnecessary since all parallel printers have no serial protocol or baud rate setting. The next section also rarely needs change from the default settings found on the distribution diskette. Finally, the section entitled 'Special Values' consists of entering which drives you want the program to access, the type monitor you have, the logon message which is sent when the system automatically answers a call and asks whether or not the computer is direct connected to another one.

Parameters

Smartcom II supports up to

Continued on page 68

Compaq's Deskpro
Continued from page 64

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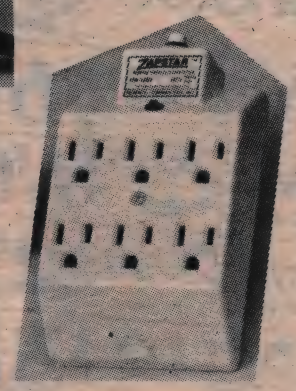

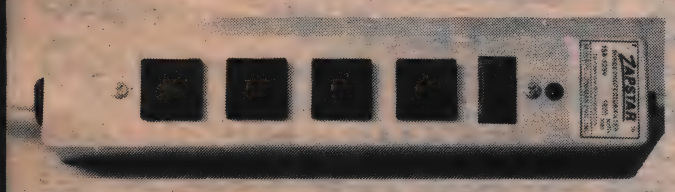

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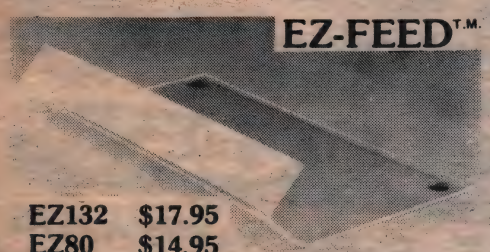

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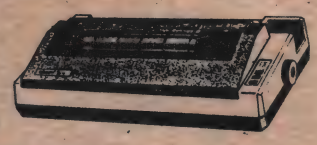

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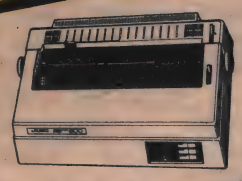

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June 1985

Smartcom II
Continued from page 66

25 different pre-programmed phone numbers specified by letters of the alphabet. The 26th set is a standard set which cannot be changed. It is this section that must be properly installed for each location you wish to contact.

A sample of the parameter screen looks like this:

Parameters Diagram
On Page 69

This section requires a little information concerning the keys you want to assign to perform certain functions, transmission characteristics and telephone data. Most are self explanatory but these show the power of the package. Aside from providing the necessary support for the 2400, several other enhancements have been added to the program; they include support of the XMODEM protocol, several terminal emulation modes, a macro protection feature and additional communications protocols.

Modems

The original versions of Smartcom II supported two protocols, one was basically an ASCII data capture and the other was a proprietary protocol which was used for 'error-free' file transmissions. If you were accustomed to using your computer to access local bulletin board systems (BBS), you would quickly discover that downloading programs with Smartcom was impossible.

Hayes finally listened to their customers and added the XMODEM file transfer protocol to Smartcom. Now, Smartcom has many of the same features as other programs like Modem 7, PC-Talk and others. Unfortunately, the XMODEM transfers are very slow. When transferring a small file, I actually had to look at my indicator lights to make sure I was still transferring at 1200 baud!

Terminal Emulation

Also added to the new version of Smartcom is terminal emulation for TTY, Televideo, VT-100 and VT-102. This allows you to call up mini and mainframe computers and use them as though you were connected via a dedicated terminal. There are some limitations, however, but those are documented in the manual.

Macro Protection

Smartcom has the ability to provide extensive macros and auto logons for each communications set installed. If you are using the auto logon feature, chances are your security access codes are available to others even though you don't want anyone else to have them. Well, Smartcom included a feature enabling you to 'protect information' contained in macros.

If a macro is used to log onto a system, the information can be coded so that anyone operating the system can press a button and have the information sent to the remote terminal. They cannot look at or see what the information is; it is unavailable for inspection. This is especially useful in situations like schools where access codes are needed but dissemination of the codes are unwise.

Communication Protocols

This version of Smartcom continues to support direct connect and Bell standards. In order to support the 2400 baud service, an addition format has been implemented, the CCITT. In the direct connect mode, you can operate at speeds ranging from 110 baud to 9600. Bell protocol will support 110 to 1200 baud, while CCITT supports from numerous speeds up to 2400 baud.

Click

One final parting shot on the Smartcom II software. Every time I loaded the program from my hard disk, it made the disk 'click' just before the first screen came up. The disk seemed to try to stop then restart a split second later. Since no other piece of software has ever done that to my system before, I became somewhat apprehensive as to what was causing it. Aside from that, the software is as much as it was before the 2400 baud modem. Also, since the software is sending more in the way of control codes, it is somewhat slower than the previous version; delaying some commands by as much as five seconds.

Conclusion

While a chain is only as good as its weakest link; the modem is only as good as the phone lines its connected to. Given the state of Ma Bell, many will argue that the current analog equipment used by the telephone companies is the real barrier to high speed digital transmissions.

The 2400 baud modems have been designed to work with most of the limitations imposed by the current analog equipment. Even so, users of the 2400 baud services may encounter difficulty in maintaining error free communications and many will finally opt to operate at the slower 1200 baud mode rather than face the constant inconvenience of garbled messages and dropped characters. The Hayes 2400 baud modem does have "fall back" so that if there is a problem transmitting or receiving at 2400 baud, the system automatically "falls back" to 1200 baud.

Once the transition from analog circuits to digital circuits is completed, the door will be opened for the next generation of modems which may operate at speeds of 9600 baud or greater. Until that day, the Hayes 2400 represents the forerunner in this generation of high speed modems.

One significance to the introduction of the Hayes 2400 is the sharp decline in price for the 1200 baud modems. In the last issue of the Shopper, I noticed one dealer selling the 1200B's (modem on a board for the IBM) for the unheard of price of $299. So if the Hayes 2400 doesn't fit your needs (or budget), you can console yourself with a great deal on a Hayes 1200 baud. ●

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PC-WRITER
Continued from page 38

the printer to a Xerox 820, and Radio Shack Color Computer. But compatibility can play tricks on you. Yes, I could connect it to the PCjr and print text with it but something was missing. I could not print the several dozen characters and symbols unique to the PC. In addition, some software, particularly graphics oriented material would not print properly. Even more disappointing is having a single keystroke graphics dump capability built into a computer with no way of accessing it!

The obvious but costly solution to these problems is to consider the 82a obsolete for this purpose and purchase an IBM compatible printer like the IBM Graphics Printer (a close cousin to the Epson family of printers). There is another method of solving this problem, that is, using a "personality module" designed to make the Oki printer compatible with the PC. I became aware of such a device called "PC-WRITER" when I evaluated a similar printer

Continued on page 160

Smartcom II
Continued from page 68

```
                          CONFIGURATION          Press F2 For Help
PRINTER :                         Port:  PARALLEL
                        Serial Protocol:
                                  Baud:
                  Remove Extra Line Feeds:  NO
                             Add NULs:  0
SMARTMODEM :                      Port:  COM1:
                          Dialing Method:  TONE
                    Pause Time For Comma:    2  (  0-255  seconds )
                     Touch-Tone Timing:     70  ( 50-255  0.001 seconds )
                     Wait For Dial Tone:     2  (  2-255  seconds )
                  Wait For Carrier Signal:   20  (  1-255  seconds )
                 Recognize Carrier Signal:   10  (  1-255  0.1  seconds )
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                    Available Disk Drives:  ABCD
                  Monitor and Adapter:  MONOCHROME DISPLAY ADAPTER WITH MONITOR
                        Log-on Message:  Andrew M. Fried * Titusville, Florida
                     Direct-Connect Port:  NONE

                              PARAMETERS
  Name of Set: Z - Standard Values

      TRANSMISSION PARAMETERS                  KEYBOARD DEFINITIONS
                Duplex:  FULL                  Escape Key:  128 (F1)
       Connection Type:  Bell  1200              Help Key:  129 (F2)
Character Processing:  FORMATTED               Printer Key:  130 (F3)
  Show Control Codes:  NO                        Capture Key:  131 (F4)
             Page Pause:  NO                Macro Prefix Key:  132 (F5)
   Show Status Lines:  YES                       Break Key:  133 (F6)
         Confidential:  NO                     Break Length:  35 (0.01 sec.)
  Include Line Feeds:  NO                      Protect Key:  0 (NONE)
      Character Delay:  0 (0.001 sec.)
           Line Delay:  0 (0.01 sec.)        PROTOCOL PARAMETERS
    Character Format:  8 DATA + NONE + 1 STOP  Receive Time-out:  60 (sec.)
             Emulator:  TTY                      Send Time-out:  10 (sec.)
                                          Error-Free Protocol:  HAYES
      TELEPHONE PARAMETERS              Stop/Start- Stop Char:  19 (DC3)
  Answer On Ring:  1                             Start Char:  17 (DC1)
  Remote Access:  NONE   Password:       Send Lines- EOL Char:  10 (LF )
   Phone Number:                               Prompt Char:  32 (" ")
```

Public Domain
Continued from page 62

```
documentation.
PRINTALL.BAT

The four 3by5 documentation files.
CHAP1&2.DOC
CHAP3.DOC
CHAP4&5.DOC
CHAP6.DOC
Introduction:
describes how to print documenation.
README

CPCUG 036 is a 2 disk set
(036a and 036b)
File  Express  is  a  Database
Management  System  for the IBM PC
and Compatibles.

CPCUG 036a
FILE  EXPRESS  Version 2.60
PROGRAM DISK

README1
The file you are now reading

FE.EXE
Main program of File Express

DEFINE.EXE
Used by File Express to create  new
databases

SORT.EXE
Sort program for File Express

REPORT.EXE
Report generator for File Express

LABEL.EXE
Label printing program used by File
Express

CPCUG 036b
FILE  EXPRESS  Version 2.60
UTILITY DISK

README2
The file you are now reading

SEARCH.EXE
Search  and  Merge program used  by
File Express

IMPORT.EXE
This  is  a run-alone  file  import
utility  that  will  convert  a
sequential  or  fixed  length  file
into File Express format.
User Manual documentation
FE-1.DOC
FE-2.DOC
FE-3.DOC

PRINTDOC.BAT
Batch  file used to print the above
documentation.

Sample files for example problem
EXAMPLE .DTA
EXAMPLE .HDR
EXAMPLE .INX
EXAMPLE .STK
EXAMPLE1.REP
EXAMPLE. LBL
PRINTER. SET
```

If you have any comments, questions or suggestions on topics of interest please write to:

Bill Chin
P.O. Box 2085
Clifton, NJ
USA 07015-2085

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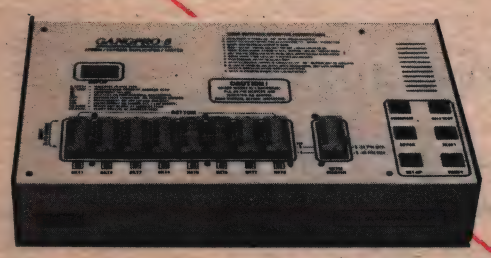

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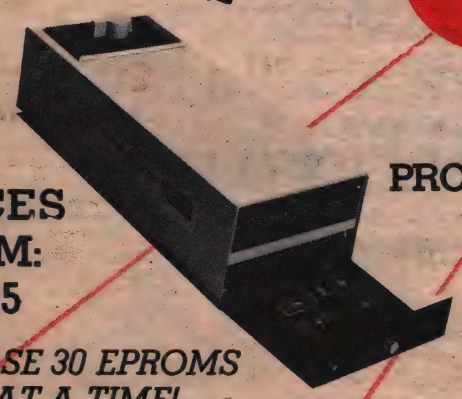

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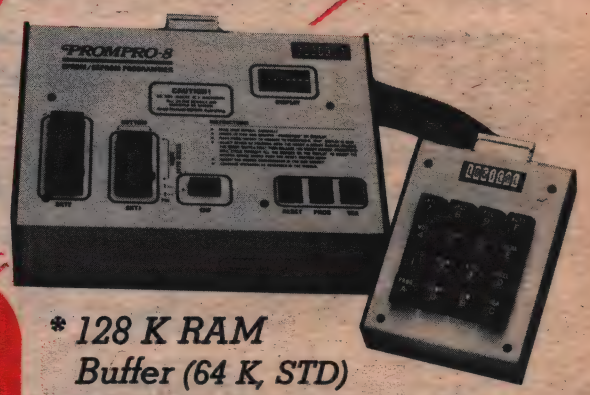

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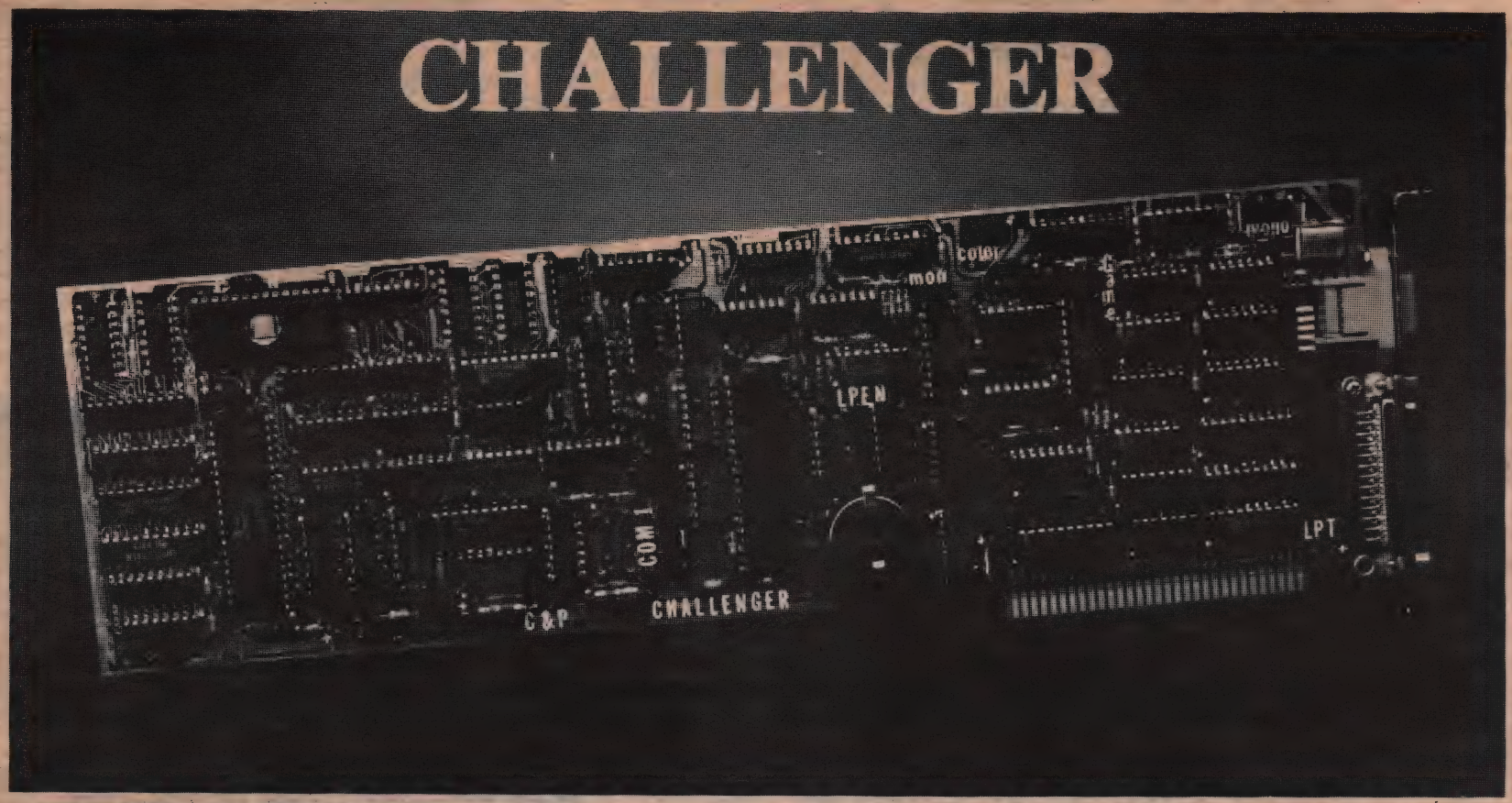

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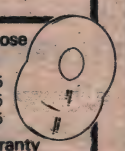

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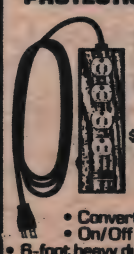
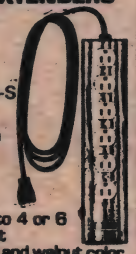


4-Plug Outlet	6-Plug Outlet
No. LG20	No. DG 115-S
PRICE	PRICE
$24.50 each	$27.50 each

UL Approved Components



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Freon TP-35

Texwipe TP-35 is a tailored blend of "Freon" and isopropyl alcohol. It is the ideal combination of these two cleaning agents, producing one solvent which attacks both contaminating soils and particulate matter. TP-35 has low surface tension, permitting it to penetrate and remove all problem soils. An inherently safe cleaner. TX-116 Solvent cleaner $3.65

Tape Racks

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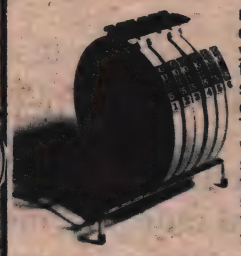
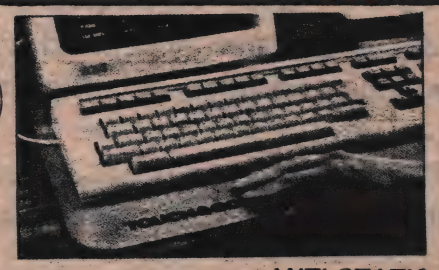


These racks allow easy, immediate access to tape, disks, and cartridges at your computer site without taking up a great deal of space. Designed for greater efficiency, yet economical. These racks are lightweight, with strong construction made of heavy duty wire with a durable silver-gray finish. Non-skid vinyl feet protect your desk top or work surface.

#1801 Tape Rack (Holds 10) $17.60



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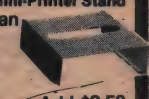

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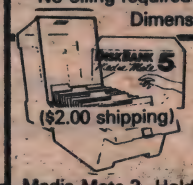

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First Interactive
Continued from page 42

much more easily, thanks to the excellent graphics and user interface of the Macintosh.

Special Utilities

StatView's special utilities include the ability to transform a data column and place the results in the same or a new column in the data file. It also permits the use of any column in the data file to determine the order of sorting and to define a new column by formula and place any current column in the formula (for example, to define column five as "(column one times column four) divided by 100," a common mathematical operation.

Analysis can be limited to any range of data using selection criteria the user specifies. Selection conditions can include up to all columns in the data file. For example, it is easy for a magazine circulation executive to select for analysis, from all subscribers, female readers between 25 and 50 who have income greater than $50,000 and live in the Northeast.

StatView was created by Dan Feldman and Jim Gagnon, who have applied their backgrounds in computer sciences, software design, and statistics to the development of interactive computer software packages for the Macintosh.

According to Feldman, the authors are concentrating on software development for the Macintosh because it is "the first and long-awaited microcomputer that permits true interaction between user and data."

"This is an incredible program," said Sherwin Steffin. "The authors have achieved an exemplary marriage of software design and computer science. StatView will revolutionize the application of statistics. Its unprecedented power will significantly reduce the effort spent in performing complex statistical operations. This product is so powerful and does so much for such a low cost that it will pay many people to buy a Macintosh just to be able to use the StatView software."

StatView is scheduled to begin shipping July 15. The StatView program will carry a suggested retail price of $199.95, including a complete manual and a copy of the book "Statistics," a standard college statistics text by Dr. Vicki Sharp. Special discounts will be available for high schools, colleges, and other educational institutions. The new, StatView package is browsable for bookstore display.

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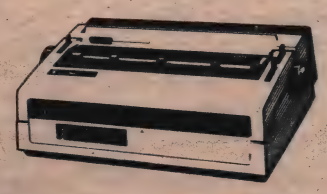
CARDCO		
Cardprint/B Comm.	60	49
Cardprint/G Comm.	90	75
ORANGE MICRO		
Grappler ³ Apple II	175	109
Buffered Grap ³ Apple II	239	155
Grappler CD Comm.	139	95
SANYO		
Video Board	219	179

DISK DRIVES

	List Price	Our Price
IOMEGA		
Bernoulli Box 5 meg Mac	1895	CALL
Bernoulli Box Single 10 meg IBM PC/XT	2695	2069
Bernoulli Box Dual 20 meg IBM PC/XT	3695	CALL
Bernoulli Box Plus 10 meg IBM PC/XT	2895	2199
Bernoulli Box Plus 20 meg IBM PC/XT	3895	CALL
Bernoulli Box Single 10 meg T.I.	2795	CALL
Bernoulli Box Dual 20 meg T.I.	3795	CALL
Most Adapter Plus Card IBM PC	355	CALL
TALLGRASS		CALL

MONITORS

	List Price	Our Price
PRINCETON		
Max-12 12" Amber IBM	249	179
HX-12 12" RGB IBM	695	CALL
SR-12 12" RGB IBM	799	CALL
Scan Doubler IBM Int.	249	CALL
RGB-80 Apple Int.	185	CALL
TAXAN		
115 12" Green NSTC	169	119
116 12" Amber NSTC	179	129
121 12" Green IBM	189	139
122 12" Amber IBM	199	149
210 12" Color NSTC	349	
420 12" Super RGB	579	409
440 12" Ultra RGB	799	575
AMDEK		
300G 12" Green	179	129
300A 12" Amber	199	139
310A 12" Amber IBM	230	169
Color 300 12" Color	349	CALL
Color 500 13" RGB IBM	525	CALL
Color 600 13" RGB/Comp	599	CALL
Color 700 13" Super RGB	749	CALL
Color 710 13" Ultra RGB	799	CALL
COMREX		
CR-5650 12" Green	129	105
CR-5650 12" Amber	129	105
ZENITH		
ZVM123 12" Green NSTC	149	109
ZVM124 12" Amber IBM	199	139
ZVM135 12" RGB/Comp	599	479
ZVM136		CALL



PRINTERS

	List Price	Our Price
CITIZEN		
MSP-10 160/40 CPS	499	355
MSP-15 160/40 CPS	749	535
MSP-20 200/50 CPS	699	495
MSP-25 200/50 CPS	949	665
ANADEX		
9620B 240/120 CPS	1380	1095
9625B 240/120/60 CPS	1500	1195
DJP6500 500/275/125 CPS	2995	2385
DATAPRODUCTS (IDS)		
8010 180/90/30 CPS	649	485
8020 180/90/30 CPS	849	635
8050C 200/110/35 CPS	1895	1415
8070C 400/200/75 CPS	2395	1775
OKIDATA		
ML83A 120 CPS	749	565
ML84P/IBM 200/50 CPS	899	695
ML92P/IBM 160/40 CPS	499	CALL
ML92MAC 160/40 CPS Apple Image	569	375
ML93P/IBM 160/40 CPS	799	CALL
ML93MAC 160/40 CPS Imagewriter	869	665
2350P 350 CPS	2395	CALL
2410P 350/175/85 CPS	2395	CALL
EPSON		
RX-80	269	219
RX-80 F/T II	389	CALL
RX-100	499	CALL
FX-80³	599	CALL
JX-80	799	CALL
FX-100³	889	CALL
LQ-1500	1495	CALL
COMREX		
CR-II 12 CPS	499	369
CR-III 23 CPS	795	615
CR-IV 33 CPS	1245	729
CR-420 420 CPS	1995	1615
BROTHER/DYNAX		
HR-15XL 20 CPS	599	379
HR-25	845	615
HR-35	1245	865
Keyboard	215	155

	List Price	Our Price
DIABLO		
620API 25 CPS	995	725
630API 40 CPS	2095	1575
630ECS/IBM 40 CPS	2295	1795
SILVER REED		
Exp400 P/S 12 CPS	399	265
Exp500 P/S 14 CPS	549	329
Exp550 P/S 18 CPS	649	CALL
Exp770 P/S 36 CPS	1295	CALL
QUME		
Letterpro20 22 CPS	599	435
Sprint II/40³ 40 CPS	1681	1279
Sprint II/55³ 55 CPS	1895	1469
Sprint II/90³ 90 CPS	2800	2095
TOSHIBA		
P1340R 120/54 CPS	995	755
P1351R 160/100 CPS	1895	1299
PANASONIC		
KX-P1090 80 CPS	399	209
KX-P1091 120 CPS	499	CALL
KX-P1092 180 CPS	599	CALL
KX-1093 160 CPS	899	CALL
KX-P3151 23CPS	699	CALL
NEC		
2050 20 CPS	850	649
3550 35 CPS	1895	CALL
8850 55 CPS	2495	CALL
P2T	875	CALL
P3T	1250	CALL
STAR MICRONICS		
SG-10	299	249
SG-15	499	409
SD-10	499	379
SD-15	599	495
SR-10	649	CALL
SR-15	799	CALL
JUKI		
6100	599	CALL
6300	995	779

COMPUTERS

MODEMS

	List Price	Our Price
HAYES		
Micromodem IIE Apple II	329	169
Smartmodem 300 RS-252	289	169
Smartmodem 300 w/s Apple IIC	339	189
Smartmodem 1200 RS-232	699	CALL
Smartmodem 1200B PC/AT w/soft	599	CALL
Smartmodem 2400 RS-232	899	CALL
NOVATION		
J-Cat 300 Band	149	109
103 Smart Cat RS-232	249	169
212 Auto Cat RS-232	695	595
212 Apple Cat 1200 Apple II	599	409
Access 1-2-3		

	List Price	Our Price
ANCHOR AUTOMATION		
Volksmodem 1200 Ext IBM	229	195
Mark X 300B RS-232	169	115
Mark XII 1200B RS-232	399	259
US ROBOTICS		
Password 300/1200	499	275

	List Price	Our Price
IBM		
PC 256K 2DR	2295	CALL
XT 256K 1DR 10 meg	3895	CALL
PC 10 meg System	CALL	CALL
PC AT	5795	CALL
COMPAQ		
PC 256K 2 DR	2995	2195
Plus 128K 1 DR 10 meg	4995	CALL
Desk Pro		CALL
EPSON		
QX-10³	2495	CALL
PX-8 Geneva	995	CALL

	List Price	Our Price
COLUMBIA		
VP2620	3495	CALL
VP2220	2395	1875
3MPC		
MPC4220	2395	1875
MPC4620		CALL
ZENITH		
ZF-151-52 320K PC Comp		CALL
ZW-151-52 320K XT Comp		CALL
TELEVIDEO, SANYO, EAGLE		CALL

TERMINALS

	List Price	Our Price
WYSE		
WYSE-50	695	CALL
WYSE75	795	CALL
QUME and TELEVIDEO		CALL FOR PRICING
KIMTRON		
KT-7A	650	CALL
KT-7G	600	CALL
KT-7A/PC	895	CALL

SOFTWARE

IBM AND COMPATIBLES	List Price	Our Price
Lotus 1-2-3	495	CALL
Lotus Symphony	695	CALL
DBase II	495	CALL
DBase III	695	CALL
Framework	695	CALL
Multimate	495	275
Wordstar 2000	495	CALL
Wordstar 2000³	695	CALL
Electric Desk	345	209
Word Perfect	495	269
Crosstalk	195	115
Multiplan	195	139
PFS Report	125	85
PFS File, Graph, Write	140	95
PFS Access, Proof	95	69

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ORDERING INFORMATION AND TERMS: We accept MC,VISA, AMEX, MONEY ORDERS, CASHIERS CHECKS, FORTUNE 1000 CHECKS IMMEDIATELY HONORED. Personal and company checks allow 20 days to clear. FORTUNE 500 COMPANY PURCHASE ORDERS ACCETPED. WE DO NOT SHIP COD ORDERS. ALL ORDERS WILL BE SUBJECT TO A 2% PROCESSING AND HANDLING CHARGE. Prices subject to change. Not responsible for type errors. N.Y. residents add sales tax. This add supercedes all previously published ads. Certain merchandise not available for mail order. No merchandise accepted for return without a return authorization number. Returned merchandise is subject to a 0% — 20% restocking fee.

I*U*CO is the best thing to happen to personal computing since the personal computer.

I*U*CO is an idea whose time has come.

I*U*CO is the International Union of Computer Owners, an organization designed to protect the interests of computer owners and users against those who would take their money...and then deliver less than they promised.

Here's an overview of some of the vital services I*U*CO provides:

1. Access to the lowest priced, reputable vendor for nearly every computer related need; and,
2. Protection from the rip-off artists, vaporware specialists, false advertisers and other creepy, crawly creatures who have been attracted to the computer industry by the scent of your money; and,
3. Constantly updated information on software and hardware releases, bug reports, fixes and other data individually tailored to your needs through I*U*CO's exclusive Computer Registry; and,
4. Finally, a chance to get even with those characters out there who promise a lot, take your money and then deliver less than they promised.

I*U*CO: a lynch mob with a purpose.

Every computer owner has been ripped off at least once.

Or maybe a dozen times might be a more appropriate number.

In any event, we've all been victimized by the computer industry.

And it wasn't accidental: today's computer industry is filled with hypesters, rip-off artists, vaporware specialists and others whose sole function in life is to part you from your money...while delivering less than you bargained for.

The rip-off might have been a computer that wasn't quite as "compatible" as claimed. Or a computer that didn't quite get delivered at the same time as the "hundreds" of new programs that would support it.

Or it might have been a software package that didn't quite live up to its advertising hype. Possibly, you've been had by a software manufacturer who continuously upgrades their software...charging you a pretty penny for an updated version that simply gets rid of the bugs that shouldn't have been there in the first place.

In a few cases, it might even have been a vendor who took your money...and never quite got around to delivering what you paid for.

In any event, owning a computer has been an open invitation to getting ripped-off in one way or another.

Until now.

I*U*CO means protection.

I*U*CO subscribes to some very ancient wisdom: in numbers, there is strength.

Labor unions learned it a long time ago.

An individual worker had no bargaining power. All the workers in a factory, however, have a lot of muscle.

Automobile owners learned it early on. The American Automobile Association was originally organized to bring motorists together in order to lobby for new roads and highways.

Even the computer industry has learned it: computer manufacturers, software publishers and others in the industry have now banded together in order to get legislative approval for their meaningless "disclaimers" and to restrict your right to copy the software you've purchased.

I*U*CO is designed to be what every collective organization is: a means to protect the special interests of its members.

And, in this case, the members are the victims...the people who own and use personal computers.

The people who, until now, have been powerless.

First of all, I*U*CO means low prices.

The first benefit an I*U*CO member gets is the opportunity to save money.

Lots of it.

I*U*CO maintains a database of every mail-order advertisement that appears in the major computer magazines.

When you want the lowest price on something, just (electronically) mail your shopping list to I*U*CO.

Within a day, you'll get the three lowest and most recently quoted prices...and, quite possibly, some still lower prices that haven't been published at all.

I*U*CO protects you.

Of course, buying mail order can get you more than low prices.

It can also get you a lot of problems in delivery.

So, along with the low price quotation, you also get I*U*CO member evaluations and reports about the vendor...and, to make sure that you'll be happy with the product, a bibliography of reviews, articles and letters to the editor about the product or service you want to buy!

In short, as an I*U*CO member, you not only find the lowest price...but you might also find out that you don't really want to spend the money in the first place!

These are the first steps in I*U*CO's program:

1. Getting you the lowest possible prices.
2. Giving you an assessment of the potential vendor.
3. Providing information on the actual use value of the product. *(An awful lot of products sound better in their advertising than they are in reality. That's why so few companies offer a money-back guaranty.)*

Continuing protection from I*U*CO: the Computer Registry.

As an I*U*CO member, you can become part of our exclusive Computer Registry.

You simply register the appropriate information about all the hardware, software and peripherals you own with I*U*CO.

Then, as updates are announced, problems are discovered, fixes released and so on, you automatically get this information.

No more finding out a year after the fact that the current version of your program is 3.14...not the Version 1.7 program you've been using. Likewise, you might find out that the mysterious system error messages you've been getting aren't just your problem, but rather wide spread.

(As a personal note, this I*U*CO service is invaluable.

In the early days of personal computers, hardware, software and peripheral manufacturers used to be pretty good about sharing information.

Today, they're not.

In the last few weeks, I personally have learned: a) my MacIntosh 512K Upgrade is defective and won't work with MacPaint under certain circumstances; b) the ROMS in my Anadex printer have been upgraded; c) the ROMS in my IOMEGA Bernoulli box have been upgraded; d) MicroPro eliminated the copy protection on my version of Wordstar 2000 Plus; e) MicroPro had a bug in InfoStar for more than 18 months...and didn't tell anyone.

I*U*CO membership would have avoided these unpleasant surprises.)

With I*U*CO, you get the information you need on an individualized basis...and you get it fast.

You don't have to tear your hair out wondering about a problem. You might even find out about the problem before you encounter it!

I*U*CO: the iron fist.

The best part of I*U*CO has been saved for last.

Yes, I*U*CO will get you lower prices and will give you solid information about the integrity and usefulness of products and vendors.

But, more importantly, your membership in I*U*CO gives you the power of belonging to a community...a community of computer owners and users who need to protect their rights.

For instance, a group of software publishers recently managed to get the Louisiana legislature to pass a law "legalizing" the non-warranties they provide with their software. (You know, "this software is sold without any representations that it will work".)

I*U*CO will fight that kind of nonsense by lobbying against it.

Likewise, when a company...even a major company...announces vaporware, I*U*CO will use the same tools to fight back...to prevent publishers and dealers from getting us all aglow about a new machine or a new piece of software that won't be delivered for months. (For instance, how many people would have bought the MacIntosh a year ago had they known that the "hundreds" of programs to be "shortly available" simply didn't exist?)

Finally, when the situation demands it, I*U*CO will be ready to sue. For example, what do you do in a situation where you run out and buy Wordstar 2000 Plus...only to find out later that its files are not compatible with the original Wordstar? (If you read the advertising, it doesn't say a word about it. You find out after you've laid your dollars on the table!)

There's a lot more to the I*U*CO story.

The whole story of I*U*CO and its benefits takes eight pages to tell. Ads...especially those that tell the truth...are expensive, so we can't take eight pages in this magazine to tell the whole story.

But, if you send us a buck, we'll send you the entire I*U*CO information and enrollment package.

You can make up your own mind whether it's a dollar well spent or not.

International Union Of Computer Owners, Inc.
Suite 4806
30 East Huron Street
Chicago, Illinois 60611

YES, I'm tired of being ripped off. Enclosed is $1.00. Please send me the information and enrollment package for I*U*CO, the International Union of Computer Owners.

I understand that I am under no obligation to enroll.

**** PLEASE PRINT ALL INFORMATION ****

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

MAKE OF COMPUTER _____

I*U*CO International Union of Computer Owners, Inc.

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EASTCOAST SOFTWARE

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APPLE

CAT #		LIST	OUR PRICE
1298	ADVENTURE WRITER	39.95	30.75
2104	AGENT USA	39.95	27.05
0560	ALGEBRA 1	39.95	27.05
1142	ALIEN ADDITION	34.00	23.05
0013	ALPHA PLOT	39.50	26.35
2598	ALPHABET ZOO	29.95	20.30
0151	APPLE MECHANIC	29.50	19.70
0490	APPLE USERS GUIDE 2/2E	17.95	14.50
0536	ASSEMBLY LINES (BOOK)	19.95	15.35
1448	BACK TO BASICS ACCT 2E/2C	195.00	123.75
0042	BAG OF TRICKS	39.95	27.65
1204	BANK ST. WRITER 2C/E-128K	69.95	47.35
1685	BANK STREET FILER	69.95	47.35
1405	BANK STREET STORYBOOK	39.95	25.55
0211	BARRON'S COMPUTER SAT	89.95	60.90
0278	BEAGLE BAG	29.50	19.70
0126	BEAGLE BASIC	34.95	23.30
1192	BEAGLE GRAPHICS	59.95	40.00
0658	BENEATH APPLE DOS	19.95	14.95
1385	BENEATH APPLE PRODOS	19.95	14.95
0111	BOOK OF APPLE SOFTWARE '85	24.95	16.00
1375	BPI GENERAL ACCOUNTING //E	395.00	263.35
0448	BUMBLE GAMES	39.95	27.05
2880	C.H.PRODUCT MACH 3 (2E/C)	54.95	38.05
2816	C.H.PRODUCTS MACH 2	44.95	31.15
2817	C.H.PRODUCTS MACH 2E/2C	44.95	31.15
2883	C.H.PRODUCTS MACH 3	54.95	38.05
1417	CHARLIE BROWN'S ABC'S	39.95	27.05
0386	CHESS	69.95	46.65
1432	CODEWRITER	140.00	80.75
0416	COMPUSERVE STARTER KIT	39.95	24.35
1138	COMPUTER SAT (HARCOURT)	79.95	54.15
1731	COPY 2 PLUS 5.0	39.95	24.40
1468	CRICKET 2C	179.95	133.35
1900	D-CODE	39.95	26.65
1645	DAZZLE DRAW-2C/2E (128K)	59.95	40.60
1265	DB MASTER PLUS	295.00	208.05
0052	DEADLINE	49.95	33.80
0630	DELTA DRAWING	39.95	27.05
1143	DEMOLITION DIVISION	34.00	23.05
1539	DISK 3-RING VINYL PAGES-10	6.75	4.10
1166	DISK BANK (50)	19.95	11.00
1722	DISK BOXES (5 COLOR CODED)	25.00	12.50
2866	DISK DRIVE EXTENSION CABLE	19.75	16.70
2833	DISK QUIK	29.50	19.70
1205	DOLLARS & $ENSE-2C	119.95	81.20
0409	DOLLARS & $ENSE	100.00	67.65
0216	DOS BOSS	24.00	16.00
0983	DOUBLE TAKE	34.95	23.30
2205	DUST COVER - IMAGEWRITER	10.00	7.15
2285	DUST COVER EPSON RX 80	7.99	5.75
2028	DUST COVER MICROLINE 92	8.95	6.40
1760	DUSTCOVER-APP.KYBOARD-2+/E	7.99	5.75
0360	EARLY GAMES YOUNG CHILDREN	34.95	23.75
1377	ECHO 2+ SPEECH SYNTH.	149.95	115.35
0092	ELEPHANT DISKS SS/DD (10)	37.00	14.75
1337	ELEPHANT DISKS SS/SD (10)	34.00	14.10
0107	EPSON MX-80 RIBBON	14.00	6.30
0029	ESSENTIAL DATA DUPLICATOR	79.95	49.95
0314	EZ PORT II	34.95	24.20
0280	FACEMAKER	34.95	23.65
1113	FAHRENHEIT 451	39.95	27.15
1126	FIGURES AND FORMULAS	29.95	20.75
1520	FINGERPRINT INTERFACE	149.00	120.00
0850	FLASHCALC (PRO DOS)	99.00	68.55
0553	FLEX TYPE (FLEX TEXT)	29.50	19.70
2821	FLIGHT SIMULATOR II	49.95	38.05
1440	FLIP-N-FILE (50 DISKS)	19.95	11.30
2796	FONTRIX	75.00	48.75
0009	FORECAST	59.95	41.50
0554	FRAME-UP	29.50	19.70

CAT #		LIST	OUR PRICE
1127	GAME SHOW	39.95	27.05
0733	GEMSTONE WARRIOR	34.95	25.55
0046	GENERAL MANAGER II	229.95	153.30
0573	GERTRUDE'S PUZZLES	44.95	30.45
2213	GHOST BUSTERS	39.95	30.75
2843	GLOBAL PLE/BEAGLE BROS	49.95	33.30
1530	GRAMMAR EXAMINER	44.95	30.45
1100	GRANDMA'S HOUSE	34.95	23.65
0043	GRAPHICS MAGICIAN	59.95	40.00
0028	GUIDE TO THE APPLE //C	12.95	10.00
1437	HEAD CLEANING KIT	29.95	17.30
1346	HITCHHIKERS GUIDE GALAXY	39.95	26.90
1364	HOME ACCOUNTANT 2C/E-128K	74.95	48.05
0197	HOME ACCOUNTANT	74.95	48.05
2804	HOMEWORD	69.95	46.60
1901	I.O. SILVER	29.95	19.95
1589	IN SEARCH OF AMAZING THING	39.95	27.05
0442	JENNY OF THE PRAIRIE	39.95	27.15
0449	JUGGLES RAINBOW	29.95	20.30
2671	KAMELEON 2C INTERFACE	99.95	65.75
1917	KARATEKA	34.95	23.65
1442	KINDERCOMP	29.95	20.30
1144	KING'S QUEST	49.95	33.30
0003	KNIGHT OF DIAMONDS	34.95	23.30
1693	KOALA GRAPH TABLET-2E/2C	124.95	83.50
2954	KRELL LOGO	89.95	76.95
2972	LABELS 1-IN WHITE (1000)	9.95	6.75
2890	LEARNING BRIDGE MADE EASY	79.95	54.15
1463	LEGACY OF LLYLGAMYN	39.95	26.65
0403	LISA 2.6	79.95	61.55
0806	LOCKSMITH 5.0	99.95	70.55
1708	LODE RUNNER CHAMPION-HINTS	9.95	6.80
0982	LODE RUNNER	34.95	23.65
0194	MAGIC WINDOW 2	149.95	103.85
0192	MASTER TYPE	39.95	27.05
0089	MAXELL SS/DD DISKS (10)	38.70	18.60
2357	MEGAWORKS (2E/2C)	125.00	86.55
2147	MICRO COOK-APPETIZERS-2E	12.00	8.00
2146	MICRO COOK-SOUPS/SALADS-2E	12.00	8.00
0227	MICRO COOKBOOK //C	40.00	26.70
2148	MICRO COOKBOOK //E	40.00	26.70
1294	MICRO-SCI 2C DISK DRIVE	299.00	248.75
1316	MICRO-SCI A2 DISK DRIVE	345.00	216.65
1509	MICROLINE RIBBON	3.20	2.20
2802	MICROMODEM 2E W/SMARTCOM I	329.00	234.75
1347	MILLIONAIRE	49.95	34.60
1135	MINUS MISSION	34.00	23.05
0774	MOCKINGBOARD WITH SPEECH	219.00	168.50
1400	MOPTOWN HOTEL	39.95	27.05
1709	MR. PRINTER STAND	29.95	20.30
0580	MULTIPLAN (APPLE DOS)	195.00	135.00
0423	NIBBLE'S AWAY II	69.95	53.25
0563	PADDLE-ADAPPLE COMBO	29.95	26.90
0568	PAPER GRAPHICS	49.95	33.95
2893	PARAL PRINTER EXT CABLE 6'	34.95	21.80
0635	PARALLEL INTERFACE W/CABLE	69.95	52.45
1418	PEANUTS PICTURE PUZZLERS	39.95	27.05
0088	PFS ACCESS-2E/2C	70.00	47.40
1413	PFS FILE //E	125.00	84.60
1415	PFS GRAPH //E	125.00	84.60
1414	PFS REPORT //E	125.00	84.60
2809	PFS WRITE //E	125.00	84.60
0495	PIE WRITER 2.2 (40/80)	149.95	101.50
0882	PRACTIFILE 64 (D)	54.95	37.20
0584	PRESCHOOL IQ BUILDER 1	24.95	16.90
1196	PRINT SHOP	49.95	33.85
1793	PRINTSHOP GRAPHICS 1	24.95	16.90
0256	PRINTSHOP PAPER PACK	19.95	15.35
0349	PRO BLACKJACK - K. USTON	69.95	48.45
0461	PRONTO DOS	29.50	19.70
1279	PROWRITER NYLON RIBBON	10.00	6.65
0047	QUEST	34.95	23.75
2111	RAMCARD 16K-MPC	99.00	60.25
1386	RAMCARD 16K-WIZARD	95.00	62.85
2309	RAMWORKS/64K	179.00	149.15
0771	RF MODULATOR-INTERNAL	39.00	17.40
1450	RHYMES & RIDDLES	29.95	20.30
0574	ROCKY'S BOOTS	49.95	33.85
0133	SCREENWRITER II	129.95	86.65
0041	SENSIBLE SPELLER IV	125.00	83.35
1206	SENSIBLE SPELLER-PRO DOS	125.00	83.35
0447	SIDEWAYS	60.00	40.00
0400	SILICON SALAD	24.95	16.65
1340	SKY FOX	40.00	28.50
1373	SMARTMODEM 2C W/SMARTCOM I	339.00	265.60
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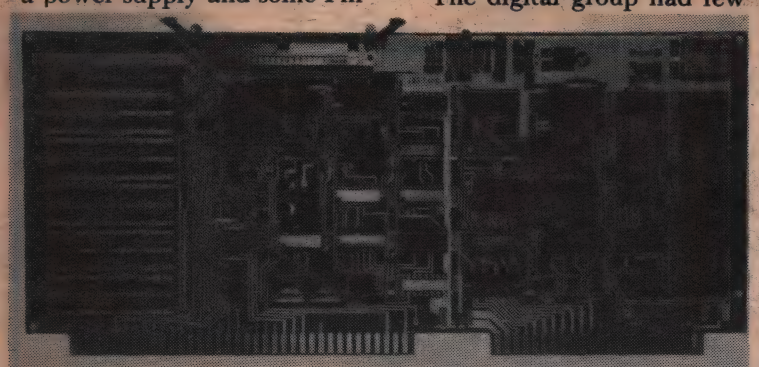
Stan Veit's History
Continued from page 42

entire system resting on the top of your workbench. Then you connected the mother board to a power supply and some Phi Decks and you were off and computing. This did not disturb the hobbyist users in the slightest. In fact they liked the idea of being able to get to everything.

The digital group had few dealers and sold mostly directly from the "factory" in Denver. They did not package the entire "system" in one box as most other manufacturers did. If you ordered a system you would get your components piecemeal, whenever digital group was "running" a board, that is what they would ship. This style hurt the efforts of dealers and systems houses who were trying to package digital group computers into business applications. One dealer Personal Computers of Penna. (they coined the term, by the way) packaged digital group computers into attractive wooden cabinets and set them up for their customers. I was also somewhat of a dealer for digital group but on a much more relaxed basis. If a person came into my store and wanted to buy a digital group kit, I related all the problems to be overcome before the computer was up and running. If they still wanted it, we would order the system. The buyer had to pay for the complete system with the knowledge that parts would dribble in over the next four to six months.



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Digital group resisted the floppy disk and operating systems for a long time but there were problems with Phi Decks and with the long lengths of recording tape used with them. As far as I know they never went to floppy disks, but the users of the system did adapt controllers and ran all of the popular DOS with digital group systems.

As the industry grew and became more organized the lack of business knowledge of the people in digital group finally caught up with them

Continued on page 166

MacUniverse
Continued from page 41

solely for use on the Laser Writer. If you do use it, it will convert your MacWrite Version 2.2 files to a new format. Thereafter Version 2.2 will be unable to use those files.

This month I have three CompuServe programs to pass on. The first two are replacements for the Finder programs. The first is called FNR.HQX and is a microfinder that takes up only 3K on a disk. It is free and requires BINHEX 4.0 to convert it. The second is called SKIP42.HQX. It is a desk accessory that allows you to move from application to application without returning to the finder and is invoked after quiting a program. Also, it continues to skip the finder until told to do so. This is FreeWare and the author asks you to send him what you think it is worth. Both of these files are found in the DL3 database and require BINHEX 4.0 to convert them.

The third program is an arcade game called MEGA.HEX. It is very similar to the game Asteriod. It is free and found in MAUG's DL4 database.

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AD # 12

Inside the VIC-20
Continued from page 45

drive mechanism inside the plastic case of the drive also causes the head to misalign. This is due to inadequate heat sinking and poor ventilation within the drive case. The plastic drive case acts like an insulation device to trap heat and "cook" the delicate parts of the drive mechanism.

To eliminate 1540/41 overheating problems, just follow these simple instructions:

Turn drive case upside down. Remove screws in the four corners. Take off the plastic cover, and leave it off permanently!

It may look a little weird, but it works. The circuit board will keep dust off the drive head just fine. Besides, you can always set the plastic cover over the drive, when you are not using it and it's cooled off.

If you don't like the looks of your drive without the cover, cut the last 4½" or so off of the case and put it back on. I keep the cover off my 1541 all the time and have never needed a head alignment or had a problem with dust.

Cheap Solution to Alignment Woes

If you think your drive head is already out of alignment, take heart. In the May 1985 issue of "The Transactor," Bob Drake tells you how to accurately align your 1540/41 drive with nothing more than a screwdriver! You use the "TEST/DEMO" disk that came with your drive and make some simple adjustments. With a little trial and error, you should be able to get things back in order.

Bob claims that 10 out of 11 drives he has aligned this way have worked fine. The one drive that didn't had a bad chip on the controller board, so it couldn't be aligned anyway. Each back issue of "The Transactor" runs $4.50. It's $2.95 on newstands (if you can find it). The address is at the end of this article. It may be worth a try if you are looking at a $50 repair bill for your drive and you want to save some money.

Another "TURBO" Wonder

Anyone who is using a Commodore tape drive has probably heard about the "Turbotape" program that recently appeared in COMPUTE! magazine. It left a few of us disk owners feeling a little strange. Here anybody with a VIC-20 and a 1530 Datasette could LOAD almost as fast as a 1541! Well, we needn't pout any longer, we've got revenge...

Get a copy of the April 1985 COMPUTE! Then type in or otherwise obtain a copy of the "TurboDisk" program found on page 86-ff. For the $2.95 price of the magazine, it is a utility with unbelievable value.

"TurboDisk" speeds things up about 300-400% for most loads over 2K! Instead of taking 30 seconds to load a 10K program, it takes less than 10 seconds. For some reason, to me, the 10 seconds seems even faster! For disk intensive work, "TurboDisk" really is an improvement.

"TurboDisk" works with some, but not all, copy-protected software. It also doesn't speed up "SAVE"s, "PRINT"s, "GET"s, or "INPUT"s from the disk drive, just "LOAD"s. What do you want for $2.95? But, speeding up "LOAD"s makes it very useful and a pleasure to use. So, get "TurboDisk" and get some relief from long, boring "LOAD"s. Now, if we can just get "TurboDisk" to speed up "SAVE"s, etc., we'll all be in business. Stay tuned.

The New Disk "Speed-Up" Programs

One interesting looking item I've seen advertised is called a "1541 Super ROM," sold by MegaSoft Limited. It's a ROM chip which replaces one of the DOS chips on the motherboard inside the drive. Since most 1541's have their ROM chips in sockets, it's a simple matter to replace the chip. The cost is reasonable at $39.95. I haven't seen this chip in action, but it looks interesting.

First of all, it prevents "bumps" from ever occurring. The head is driven to track #1 without beating it to death (proving that it can be done!) In addition, it speeds the disk up 2 times for most operations, some are even faster (10 sec. format with verify). They claim its 100% software compatible with the standard DOS ROMs.

The package includes a "fast loader" utility disk (normally $19.95 separate) that speeds up loads (they claim 800%!) and also makes auto-booting disks. I'll give you their address later.

That's all the "disk hints" for this month. If you like this kind of information, let me know and we'll do some more "hints and kinks" of maintenance, peripherals, etc.

Mini-Network for C-64 and VIC-20

Another very interesting gadget that recently came across my path may be of interest to some of you. If you both own a VIC-20 and a Commodore 64, or a couple of C-64s, and use both of them regularly, you may have tried to hook them both to the serial bus of your printer or disk drives.

Since both machines have serial interfaces, you should to connect both of them to the peripherals at once, right? Wrong! When you connect both machines at once, each one tries to become the bus "master" at the other's expense. As a result, both machines end up locked in an endless loop and the serial bus is useless to either one.

Warren Radio has come up with a solution: a Commodore serial bus controller called (don't laugh) the "DiscoPlexor II." Although the name sounds a little corny, it actually works. Now you can have two C-64s, VICs, or a combination hooked up, at once, to your bus peripherals and they can both read or write to the printer.

It's like a mini-local area network (take that IBM!). You don't have to throw a switch or anything. You OPEN up the files and the "DiscoPlexor" controls the bus. The price is $99.95 and you'll find the address at the end. If you inquire on this, please mention that you saw it in the Computer Shopper.

Notes on Software Compatibility

I have found another software/hardware package that our Centronics interface is compatible with: "C-Link." "C-Link" is an IEEE interface device for the C-64 that allows you to hook up the Commodore IEEE-488 bus disk drives. Included with C-Link is a built-in parallel printer driver, similar to the one in this article.

I already have mentioned that the interface works with "EasyScript." I think it may also work with "WP-64" from Pro-Line (their literature hints at the possibility). It does not work with "SpeedScript." If enough of you are interested, I might work up a patch for "SpeedScript," so let us know what you think.

A New Printer Driver!

This month we are presenting the new, improved version of the C-64 Centronics/User Port printer driver. It's in "BASIC loader" form, which means that all you have to do is type it in and "RUN" it, no assembly is required.

Because of time constraints, the VIC-20 version will be delayed until next month. Be patient, VIC owners, yours is coming (if you can't wait, send me your disk per instructions above).

I originally intended to present both the VIC and C-64 Assembler source code listings, but I didn't realize that the lightly commented, unformatted, source code would run 10 pages long! That is just impractical for us to print (unless you absolutely demand it)!

Instead, the BASIC loader is

Continued on page 148

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CBS Stuff Continued from page 46

Stip Poker "Before"

take to dinner and the show, cuddle up with Suzi or Melissa for a nice game of five card draw. But be warned, you could be a little chilly by the time the game is through. (What do you mean you're not really gonna take off your clothes? What kind of cheater are you?)

Strip Poker is just what the name implies and of course the winner sees all, so to speak. The games seem to be fair. Both players get their share of good hands. Each of the two opponents has her own style of playing and if you carefully analyze their betting patterns you can beat them. As the documentation states, Melissa is the better card player.

The game is very well designed. Played with a joystick for input, it follows fairly standard rules. Unlike most of the games I've been in, you don't need jacks or better to open. This isn't necessarily bad, since you can bet on anything. If both players hold on the initial bet, the pot stays but the cards are shuffled and redealt. Betting opportunities fall twice, once when the cards are dealt and again after the draw. The bets can be raised three times on each round of betting, so it is possible to have a fairly large pot.

The betting limit is $25. This doesn't mean you can't bet more later. For instance, although you can bet only $25 at a shot, if your opponent raises the bet, you can still raise it more. This means the biggest pot possible for a game is $200.

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Continued on page 144

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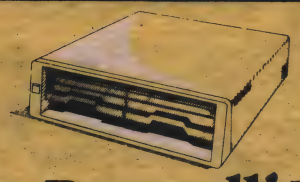

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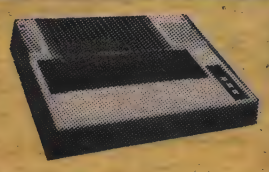

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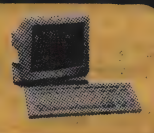

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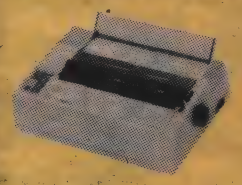

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AIM Revives

Continued from page 40

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AIM also has a very special associate membership available for vendors and manufacturers. Any Apple III software publisher or hardware manufacturer can become an AIM associate member and therefore sell his products through the "Apple III Is For Me" program. It should be specifically noted that at this time, because of authorized dealer contracts with Apple Computer, no new Apple Computer manufactured computers will be sold through this program and the program does not encourage trans-shipment of product, although some used computer equipment, at substantial discounts, are provided.

It is AIMs' purpose to pinpoint concerns among its' member locations and provide programs to enhance their already professional capabilities. The "Apple III Is For Me" program is just one more way AIM shows the public that the independent computer dealer should be their first and only choice.

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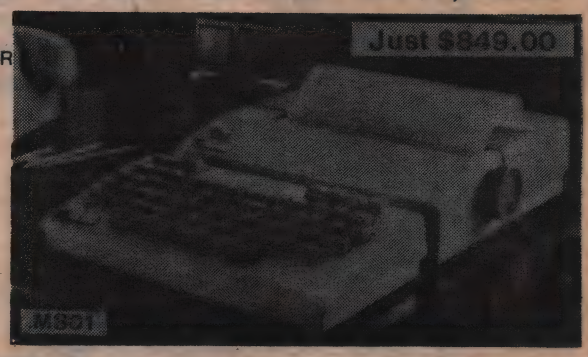

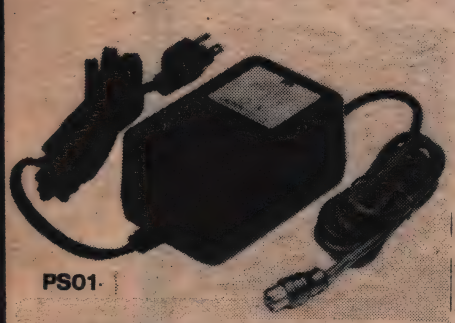

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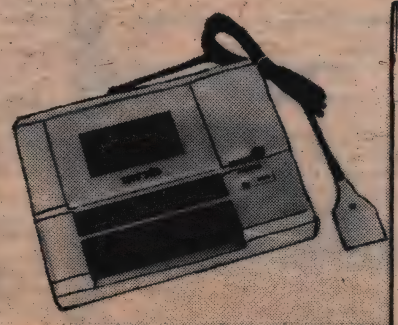

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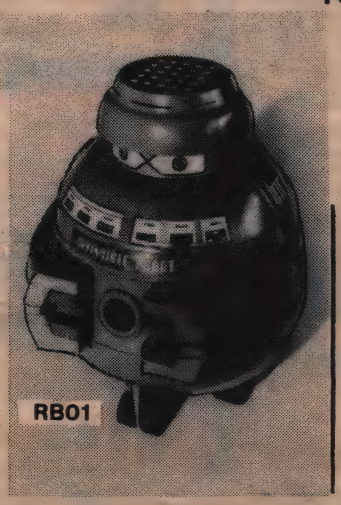

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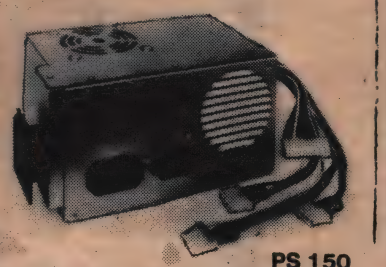

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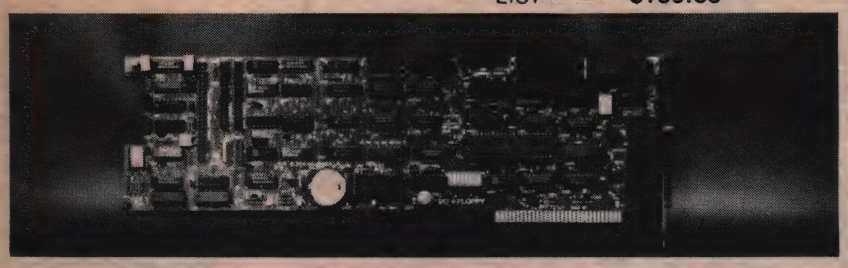

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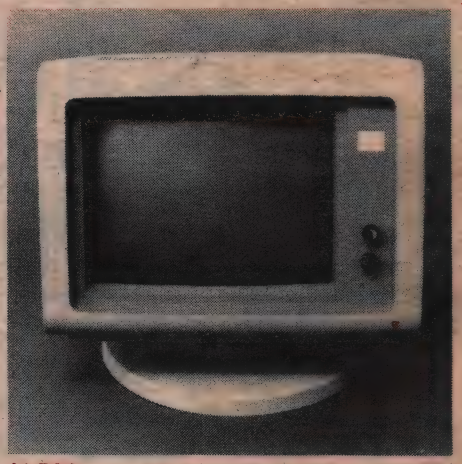

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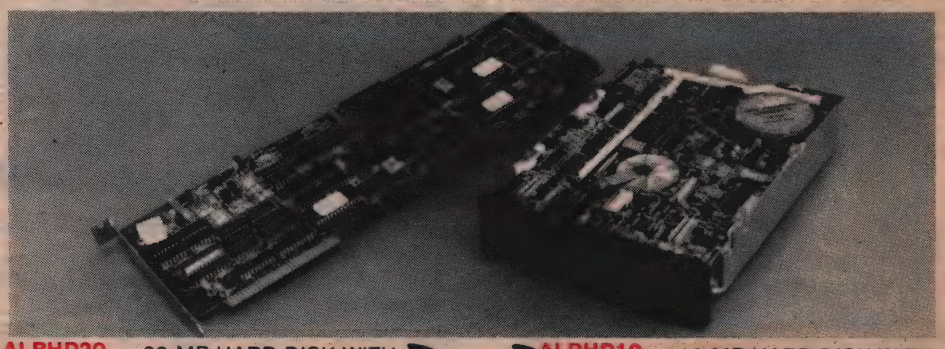

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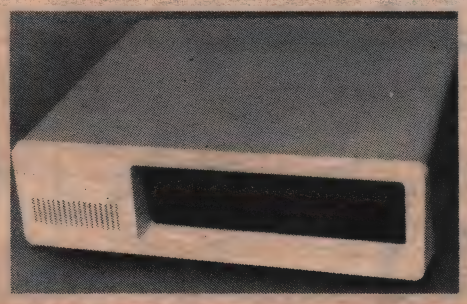

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How Well
Continued from page 55

EC.BAT file modified, the user's favorite reassignments can be put into service at the system boot. Each redefinition requires one PROMPT command string. After all of the PROMPT key redefinitions are listed, a final PROMPT command OR the name of another batch file should be used.

Batch files can be used to define particular keys for special functions, but with a parameter to define a filename. For example, an Assembly Language programmer could define function keys that would Assemble, Link, Run EXE2BIN, and DEBUG all with the same program name. Here is one way to do this with a batch file called ASMWORK.BAT:

```
PROMPT $e[0;65;"MASM %1";13p
PROMPT $e[0;66;"LINK %1";13p
PROMPT $e[0;67;"EXE2BIN %1;%1.COM;13p
PROMPT $e[0;68;"DEBUG %1.COM";13p
```

Then, use this command:

ASMWORK progname

and the program will be assembled by pressing the F7 key, link it with the F8 key, change it to a .COM file with the F9 key, and DEBUG with the F10 key.

I am sure that if the readers will try the examples and some of their own ideas they will soon find many places where this PROMPT command can be used. I should point out that the MS-DOS ANSI.SYS reserves 250 bytes for storage of keyboard reassignments. If this is exceeded, the system may crash (no damage will be done except for loss of memory contents.) However, DEBUG can be used to patch the ANSI.SYS file to increase this 250 bytes.

These prompt commands will work with the H/Z-100-PC, the IBM-PC, and IBM-PC Clones. The H/Z-100 also has a PROMPT command but the CONFIG.SYS file can include an ANSICON.DVD character device driver. I know that some users have redefined keys on the H/Z-100, but I have not. I hope to find them soon. If any reader has tried it on the H/Z-100 and they would like to share what they have done with the readers, please send me what you have and I will include it in an article.

I would like to hear from the readers of this article as to whether they like it or not. Is it too hard? Do you have any constructive criticism, good or bad? Your input will help me write what the readers want! Thank you! ●

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Berserker Raids
Continued from page 47

of the game you would devote 100% of the resources to constructing ships, since you want the ships as soon as possible. Later, you might want to devote resources to raising the technology level of some bases (for building more capable ships) and the productivity level of other bases (for the times when rapid ship construction is essential). This is an interesting aspect of the game. With skill and practice, you can determine how to allocate resources to yield the most effective combination of star bases.

Controlling Ships

Each ship constructed can be commanded to travel to other bases, unload cargo, resupply itself with cargo or orbit the star base. As a maximum of 10 ships can be in any player's fleet at one time, a "scrap" command destroys a specified ship, thereby allowing the construction of a more advanced one. When landing on a base owned by another player or a berserker, armed ships can be ordered to attack the base. On the other hand, when opponent's ships or berserkers are landing on a base owned by you, you can command your ships to retreat, dodge, or attack the incoming invaders.

Winning The Game

As the game progresses and battles become more frequent, the ownership of star bases can change hands several times. When one side has finally captured all ten star bases, a message, such as "Jeff is victorious - berserkers have been eliminated," is displayed and the game ends. A handy feature of this program permits the game play to be interrupted and saved to disk for continuation at a later time. A typical game can take several hours.

Scenarios

The idea of using a story line to set the action of the game play is a novel idea, but only one lengthy scenario is included in the documentation. "The Hunting of Hyperion," as this scenario is called, is a respectable eight pages in length. The authors apparently had grown weary, however, by the time they got to writing the other nine scenarios, each of which consists of approximately one paragraph. Take "Dijon

Continued on page 93

Applying The Atari
Continued from page 48

maining in the computer.

Even if the memory limitations are of no concern to you, the cassette recorder is far too slow for comfortable mailing list work.

The Program

Type in *Mailing List*. It is highly recommended that you use *Program Perfect* to enter this one, since there is a great chance for error. When you've entered the entire program, SAVE it to diskette. (See the end of this article for information on *Program Perfect* and on purchasing a diskette of *Mailing List*. Since Mailing List stores its data on diskette. You might want to insert a blank, formatted diskette into the disk drive before running the program. This will let you store the greatest number of names and addresses. This disk will be referred to as the *data disk*. You can use the disk on which you've saved the program, if you really want to, but you'll have less room remaining for storage.

Now RUN the program. Figure 1 shows the menu screen that is displayed if everything is working properly.

Adding Names

Naturally, little can be done with a mailing list program without the names and addresses. Hence, the first thing you'll want to do is select the ADD NAMES option. Press *A* for this operation. A data file will be created on the diskette. In a few seconds you'll be on the ADD DATA screen.

If you want to use both upper and lower case letters for your mailing list, press the CAPS/LOWR key (or the CAPS key on the XL/XE) before you start typing. Don't use all capitals for some names and a combination of capitals and lower case for others or you'll run into problems when searching for a name. A maximum of 32 characters can be typed for each data line. The CTRL (CONTROL on the XL/XE) and arrow keys can be used to move the cursor around to

Continued on page 90

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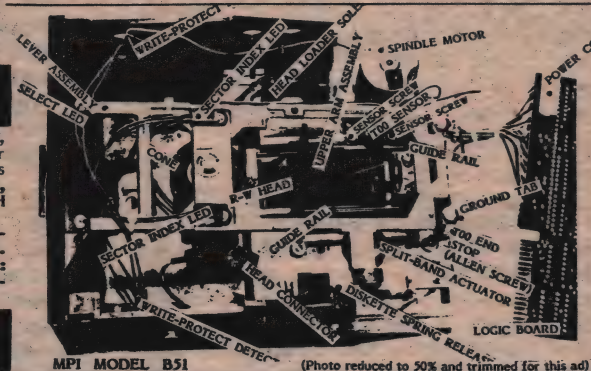

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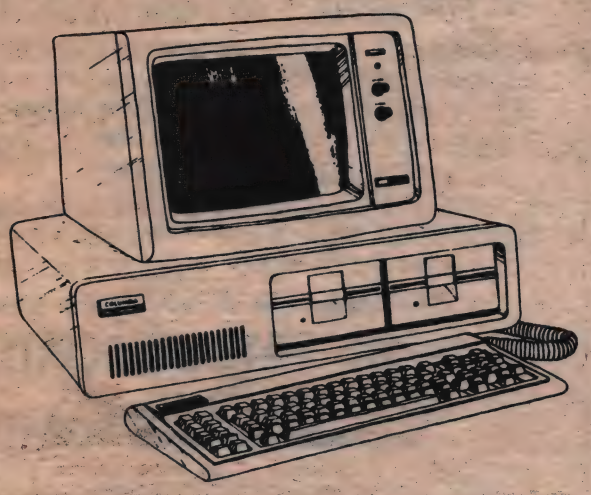

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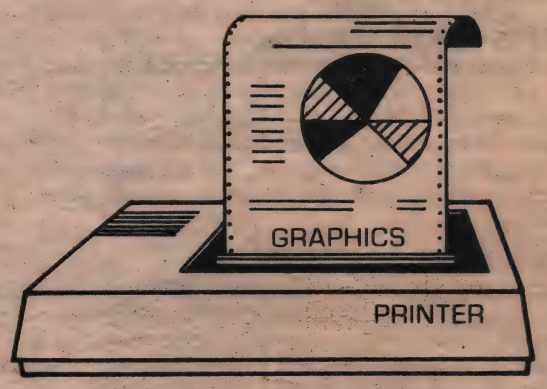

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Applying The Atari

Continued from page 87

change anything you have typed. Use the BACK SPACE and CONTROL-INSERT keys for their respective, one-character operations. To delete an entire line, use SHIFT-DELETE. The inverse video and graphics characters cannot be typed so as to facilitate the use of the search feature and also because the majority of printers cannot print these characters.

Now type in a name and press RETURN. Next type in the street address, press RETURN, and enter the city, state and zip code.

The next line is the category. Up to eight characters can be entered as a category name to classify the name you have entered. Later, names can be printed out according to category. For example: You can classify your relatives as RELATIVE, and your clients as CLIENT. Then, to invite your relatives to a get-together, you would specify the RELATIVE category when printing labels. To send out information to your clientele, you would specify the CLIENT category.

You could put the category name to good use in a birthday-oriented mailing list: All acquaintances with a birthday in, say, March, would be given the name MARCH as a category. Then, just before March comes around, you could print out labels with the names and addresses of those with a birthday in that month. Stick the labels on some card envelopes and no more late or forgotten birthdays! As you can see, this program's ability to categorize is an extremely practical and versatile feature.

After you've typed the category, press RETURN. You'll get a "MORE NAMES (Y/N)?" prompt. If you've got more names to enter, press *Y* and type them in, otherwise press *N* to get back to the menu.

Editing

Once you've built your mailing list, you might have to go back to change some entries, especially if you've discovered a typographical error or someone has changed his address. Press *E* for the Edit screen.

On the Edit screen you'll get a "CYCLE OR SEARCH (C/S)?" prompt. Press *C* if you want to cycle back and forth among the various entries. The "<" and ">" keys are used to move backwards and forwards, respectively. Attempting to go beyond the last entry will give you a nasty "LAST NAME IN FILE" message, while trying to move ahead of the first entry will give you a "FIRST NAME IN FILE" message. At any point, you can use the editing keys to change an entry. The changes will automatically be recorded on disk.

Deleting a name is accomplished by changing the category of the name to DELETED. The name isn't actually deleted (thus you can reinstate it at a later time if necessary) but it is ignored when printing out labels. You can replace a name in the DELETED category with a new name if you so desire, but be sure to change the category name.

Press ESC when you've finished making changes and you'll be returned to the menu screen.

Search Feature

Pressing *S* for the "CYCLE OR SEARCH" prompt lets you search for a name. You'll be asked whether you want to "SEARCH BY FULL NAME OR LAST (F/L)?"; Press *F* to search for an entire name, or for any portion of the beginning of the full name. For example: to find our editor-in-chief,

Continued on page 92

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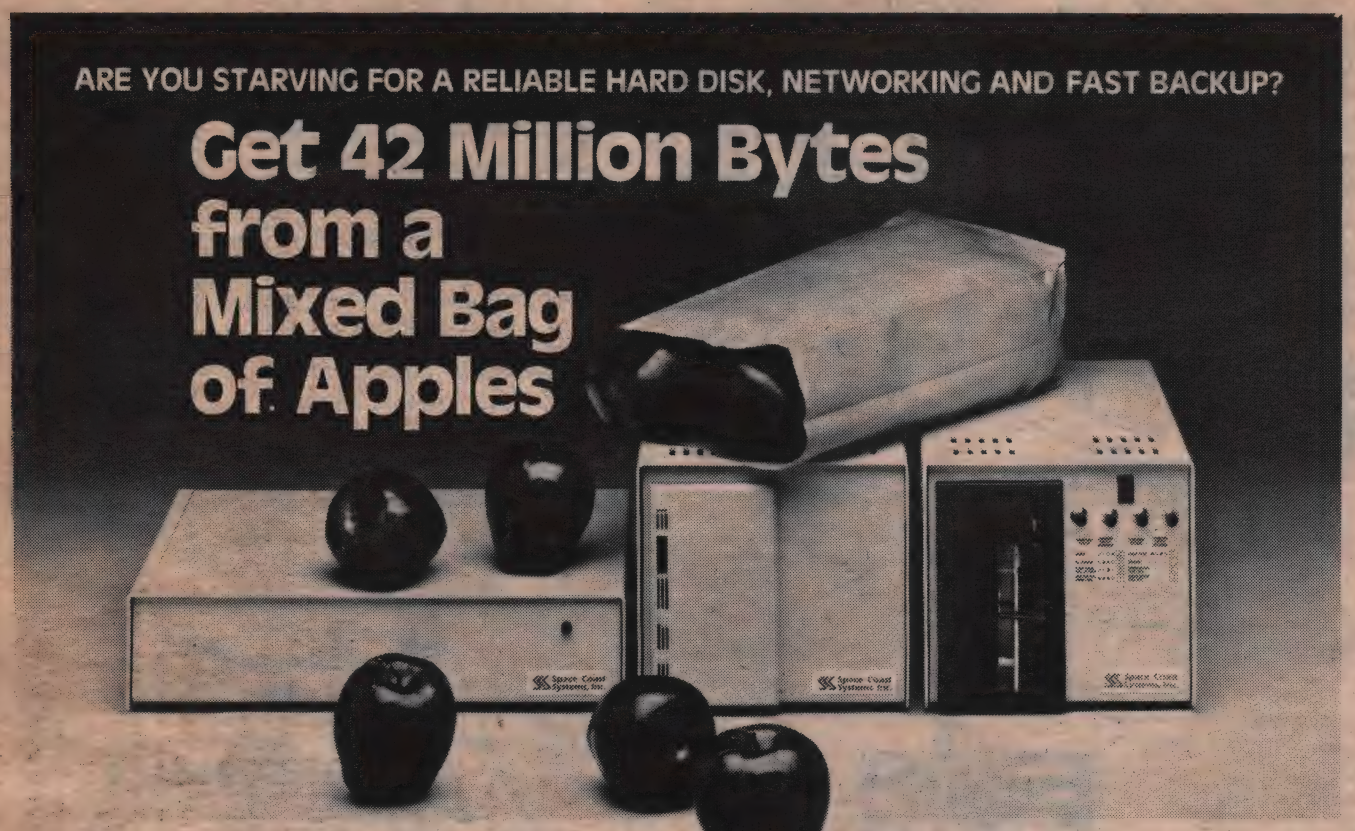

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74LS158	.28	74S04	.30			MC6889	12.50
74LS160	.60	74S05	.30	MISC		ICL7116	9.50
74LS161	.45	74S08	.25	8T26	1.28	AD7501	1.01
74LS163	.40	74S10	.30	8T28	1.28	8008	1.00
74LS164	.55	74S11	.30	8T96	.75	8048	12.50
74LS169	1.10	74S20	.30	8T98	.75	8080A	1.65
74LS173	.65	74S30	.30	TL082	.90	8085A	4.00
74LS174	.40	74S32	.30	Z80-CPU	2.00	8086	17.00
74LS175	.35	74S37	.70	Z80A-CPU	3.00	8088	17.00
74LS191	.70	74S38	.70	Z80-DMA	7.50	8133	2.00
74LS192	.70	74S40	.30	Z80A-PIO	2.00	8143	12.50
74LS193	.70	74S51	.30	Z80A-SIO1	2.00	8155-H2	5.75
74LS195	.55	74S64	.30	Z80A-SIO2	2.00	8202	19.00
74LS197	.70	74S74	.50	Z80A-SIO9	3.50	8224	2.75
74LS221	.55	74S85	1.75	AD6200	1.00	8226	3.30
74LS240	.80	74S86	.40	LM301	.28	8237A	19.95
74LS241	.75	74S112	.40	LM308	.69	8243	3.50
74LS244	.90	74S113	.38	LM318	.90	8251	3.58
74LS245	.85	74S132	1.00	LM319	1.10	8253	6.20
74LS247	.75	74S136	1.25	LM324	.50	8255	3.50
74LS248	1.10	74S138	.75	LM339	.55	8257	4.50
74LS251	.45	74S139	.75	LM348	.85	8259	5.50
74LS253	.45	74S151	.40	LF353	.85	8273	12.00
74LS257	.45	74S153	.80	LF356	.99	8275	25.00
74LS258	.45	74S157	.80	LM393	.60	8283	7.50
74LS259	1.70	74S158	.40	TL500CN	.50	8284A	4.75
74LS260	.45	74S161	1.50	518H	.51	8288	17.00
74LS261	2.00	74S163	1.60	NE521	.68	8289	19.95
74LS266	.35	74S169	3.75	NE529	1.01	8355	11.25
74LS273	.90	74S170	.20	NE555	.45	MC8500	1.01
74LS283	.40	74S174	.40	LM556	.65	MC8520	1.01
74LS298	.65	74S175	.80	NE564	1.50	MC8725	1.01
74LS324	1.90	74S181	.80	LM567	.75	8741	18.50
74LS363	1.35	74S182	1.50	592	.51	8748	18.50
74LS367	.45	74S195	1.00	TL601	1.01	8749	18.50
74LS368	.35	74S225	7.95	LM723	.28	8751	18.50
74LS373	.90	74S240	1.40	LM741N	.30	8755A	18.50
74LS374	.90	74S241	1.60	LM741-TO5	.20	8837	1.20
74LS375	.60	74S244	1.60	LM747	.60	8868	2.00
74LS377	.75	74S253	.45	uPD765	12.88	AY5-8910	8.25
74LS390	.80	74S257	.75	791	1.01	AM9109	2.01
74LS393	.90	74S258	.60	MC832P	.80	AM9114	1.01
74LS395	1.20	74S260	.60	MC846P	.80	9148	1.01
74LS533	1.75	74S273	1.90	930DC	.20	9318	1.01
74LS534	1.75	74S280	1.60	946	.80	F9324	2.50
74LS624	2.50	74S299	4.75	AY3-1013A	2.50	9334	2.00
74LS641	1.75	74S373	.70	MC1414	.90	9602	1.20
74LS645	1.90	74S374	.70	MC1455	1.01	9617	1.01
		74S412	2.05	MC1458	.40	TMS9980	9.00
7400	.15	74S533	2.95	1488	.40	10102	.50
7402	.15	74S534	.70	1489	.40	10107	.50
7403	.15			FD1795	17.00	10115	.50
7404	.15	74F02	.50	ULN2005	1.01	10123	.90
7406	.25	74F04	.70	COM2017	2.00	10125	1.50
7407	.25	74F11	.25	2101-2	.38	10133	1.50
7408	.20	74F32	.50	2102-1	.38	10153	1.75
7409	.15	74F74	.60	2107	.50	10197	1.25
7410	.18	74F151	.60	2112	1.80	MC14411	7.50
7411	.25	74F157	1.10	2114	.60	MC14433	12.50
7413	.18	74F241	2.50	2118	2.25	IDM29705	5.01
7414	.30	74F244	2.50	D2125H	1.95	50256	9.99
7416	.20	74F251	.70	2147	1.85	75107	1.01
7417	.20	74F257	1.30	2148	4.50	75113	1.01
7420	.15	74F373	3.75	2205	2.78*	75138	1.01
7421	.35	74F374	3.75	AM2504	5.01	75150	1.95
7425	.20	74F533	1.80	COM2601	2.00	75355	1.01
7426	.25	74F534	1.80	COM2651	2.01	75451	.25
7427	.20			AM2841	2.01	75453	.25
7430	.15	74H00	.25	LM2900	.68	75454	.35
7432	.25	74H04	.25	LM2901	.50	75492	.75
7437	.20	74H11	.25	AM2901	1.90	93415	1.01
7438	.25	74H74	.60	2902	.75	93419	1.01
7450	.15			LM2904	.75	93L422	1.01
7473	.30	74HC139	.99	2907	1.95	93448	1.01
7474	.30	74HC174	.99	AM2909	5.01		
7451	.18	74HC175	.99	AM2910	4.50		
7475	.30	74HC251	.89	LM2910	1.00		
7476	.30	74HC259	1.39	AM2918	1.01		

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SCREEN	MUFFIN FAN SCREENS, for std muffins 2/$1
SPDTALCO	SPDT MINI TOGGLE, solder lugs, 5A 3/$1
3PDTJBT	3PDT MINI TOGGLE, solder lugs, flat bat $1
MRB110	1-POLE 10-POSITION MINI ROTARY, .5" dia $1
2N4401	HIGH SPEED NPN SWITCHING TRANSISTORS 10/$1
1N4148	HIGH SPEED SWITCHING DIODES 20/$1
TANT15U	15uF 20V TANTALUM CAPACITORS 5/$1
EA2	5 PIN DIN PLUG, fits many computers $1.19
12FTLC	LINE CORD, 3 conductor, 12ft long $1.00
CPC	COMPUTER POWER CABLE, 5' 3-cond $2
TYWRAP	CABLE TIES, 4" nylon, locking 20/$1 1000/$25
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820CC	2 SIDE COPPER CLAD, unetched 8x20" 88¢ 10/$7
HSWBR	HEATSINK W/BUILT-ON 20A 50V BRIDGE $1
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15KCAP	15,000uF CAPACITOR, 25V, 25¢ea. 10/$1.95
15028X	15.028 MHz CRYSTAL OSCILLATORS $1
REJDISK	REJECT 5 1/4" DISKS, poss bad sectors 3/$1
MBOX	TOPLESS METAL PROJ BOXES 3.5x2.5x1.25"h 4/$1
PBOX	ASST'D TOPLESS PLASTIC PROJECT BOXES 15/$1
OAKKBSW	OAK KEYBOARD SWITCHES SPST-NO, 20/$1
STKON	STICK-ON CABLE CLAMPS for cords to 1/4" 20/$1
UTR40	40 COND RUBBER JKT RIBBON CABLE 100'/$18
E63	SUBMINI MICROSWITCHES, Cherry E63 SPDT, 4/$1
2SPKR	MINI SPEAKERS, 2", 8 ohm, excellent qual! $1
HANDSET	TELEPHONE HANDSETS, brown, like Bell, mod'lr $1
TEC30	MODULAR TELEPHONE WALL JACKS, w/terminals $2
TEC29	TELEPHONE Y ADAPTOR, plug in 2 phones $2
4COND24	4 COND PHONE WIRE awg24 alarms spkrs 50'/$2
6VRB	6V RECHARGEABLE BATTERY 450mAH fresh $3 2/$5
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DRLED	MEDIUM SIZE RED LEDS prime quality 10/$1
10ASW	10 AMP POWER ROCKER SWITCH, wired, new 5/$1
ASTLAMP	ASSORTED LAMPS 20/$1
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100DELAY	100ns DELAY LINES 2/$1
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1N4742A	12 VOLT 1W ZENER 8/$1
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Applying The Atari
Continued from page 90

Stan Veit, we could search for "Stan Veit" or, if there's only one Stan in our list, we could search for "Stan." If we are using only capital letters, then we'd search for "STAN." (Now you can see why it is important to be consistent with the use of either all capitals, or both capitals and lower case.)

Your other option is to search for the last name (Press *L*). This time, to find Stan, we'd enter "VEIT." Figure 2 shows how we can find "Computer Shopper" by searching for "Shopper."

Once you find the name you've searched for, you can make changes in the data with the editing keys, or you can use the "<" and ">" keys to move to see (and change if desired) the data preceding and following the displayed data.

Printing The Names

Now for the fun stuff. Of course, you'll need a printer — any kind will do. Position your mailing labels in your printer. If you are using double-width labels (two labels horizontally) then press *2* for the "NUMBER OF LABELS ACROSS (1/2)?" prompt, otherwise press *1*. Next you'll be asked to input the spacing between horizontal labels (if you have two labels across) and the spacing between vertical labels. Six and four are the values for these inputs, respectively, for labels of standard size and spacing. If you are using labels of other sizes, you should experiment to find the correct values for proper printing.

Once all spacing has been set, you're asked which category to print out. If you want to print every name and address on the data disk, regardless of its category (except for those marked DELETED), enter "ALL," otherwise type the specific category of the names you want printed (i.e. "CLIENTS"). When the "PRESS RETURN WHEN READY" prompt appears, press RETURN and your labels will be printed. Figure 3 shows a sample output.

```
Mr. J. Smith
100 Disk Drive
Baltimore, MD 21219

Mrs. C. Douglas
100 RAM Road
Pawcatuck, CT  06379

Mr. B. Rogers
100 BASIC Blvd.
Floral Park, NY  11004

Ms. S. Jackson
100 POKE Place
Lima, OH  45805

Mr. E. Carson
100 LIST Lane
Burlington, IA  52601
```

Figure 3

List Names

For a simple list of the names stored on the data disk, press *L* on the menu. Only the names, not the addresses, will be printed. Those names that have been deleted will also be printed, but they will be preceded by an asterisk (*).

Free Disk Memory

This will tell you how many sectors or blocks are remaining on your diskette. When this number becomes very low, you are running out of room and should begin using an additional diskette. Incidentally, the data diskette should only be changed when on the main menu screen so that the proper files will be opened on the new disk.

Next Month

We'll get into more detail on *Mailing List*, look at some POKEs and PEEKs on the XL, learn how to add a numeric keypad to the Atari, enter a new program called ATASCII Lister, and (whew!) look at some more reader mail.

Readers questions, comments and contributions are welcome. Please enclose a self-addressed, stamped envelope (SASE) for a personal reply.

A cassette or diskette of any program listed in this column is available from the author for $5.00, postpaid. Specify DOS 2 or DOS 3 when requesting a diskette.

Program Perfect is a utility used to check for typing errors in programs entered from this column. Readers may send a SASE for a listing or $5.00 for a cassette or diskette.

Address all correspondence to:

Jeff Brenner's
"Applying The Atari"
c/o Computer Shopper
P.O. Box F
Titusville, FL 32781-9990 ●

MAILING LIST

```
UIJ 10 REM MAILING LIST PROGRAM
KFJ 20 REM COPYRIGHT 1985 JEFF BRENNER
WQJ 30 DIM NAME$(32),ADDR$(32),CSZ$(32),CAT$(8),Q$(1),KB$(255),SP$(32),L$(1)
QNJ 40 DIM NAME2$(32),ADDR2$(32),CSZ2$(32),CAT2$(8),NUL$(1)
BHJ 50 SP$(1)=CHR$(32):SP$(32)=CHR$(32):SP$(2)=SP$:L$=CHR$(155)
VRJ 60 KB$(1)=CHR$(0):KB$(255)=CHR$(0):KB$(2)=KB$:RESTORE 80
INJ 70 KB$(30)="K":KB$(122)="K":KB$(31)=KB$(30):KB$(60,60)=SP$:KB$(62,62)=SP$
LFJ 80 FOR I=1 TO 7:READ J:KB$(J,J)="K":NEXT I:DATA 95,155,156,126,127,254,255
EBJ 90 DIM A$(110),B$(2),C$(1),FILE$(30),FILE2$(30),E$(2)
QHJ 100 E$=CHR$(156):E$(2,2)=CHR$(157):FILE$="D:FILE.DAT":FILE2$="D:POINT.DAT"
CYJ 110 B$=CHR$(30):B$(LEN(B$)+1)=CHR$(31)
KIJ 120 OPEN #1,4,0,"K:":OPEN #3,4,0,"E:":OPEN #4,9,0,"E:"
RVJ 130 CLOSE #5:CLOSE #2:PRINT CHR$(125);"MAILING LIST PROGRAM":POKE 84,4
QTJ 140 RESTORE 160:FOR I=1 TO 5:READ A$:PRINT CHR$(ASC(A$)+128);A$(2,LEN(A$))
LEJ 150 PRINT :PRINT :NEXT I
WDJ 160 DATA ADD NAMES,EDIT,LIST NAMES,PRINT,FREE DISK MEMORY
RAJ 170 POKE 694,0:POKE 702,64:PRINT CHR$(156);"SELECT: ";:GET #1,A
RGJ 180 RESTORE 150:FOR I=1 TO 6:READ A$:IF ASC(A$)<>A THEN NEXT I:GOTO 170
UEJ 190 PRINT CHR$(125);
QKJ 200 FOR J=1 TO LEN(A$):PRINT CHR$(ASC(A$(J))+128);:NEXT J:PRINT :PRINT
QXJ 210 PRINT :ON I GOTO 230,650,1040,1120,1350
CPJ 220 POKE 85,2:FOR I=1 TO 32-(J=4)*24:PRINT CHR$(13);:NEXT I:POKE 85,2:RETURN
PCJ 230 TRAP 250:OPEN #2,9,0,FILE$:OPEN #5,4,0,FILE2$:TRAP 40000:INPUT #5;S,B
WVJ 240 CLOSE #5:GOTO 280
QVJ 250 IF PEEK(195)<>170 THEN PRINT "ERROR #";PEEK(195):GOTO 1020
BPJ 260 CLOSE #2:B=-1:S=-1:OPEN #2,8,0,FILE$:CLOSE #2:OPEN #2,8,0,FILE2$
SBJ 270 PRINT #2;S;L$;B;L$:CLOSE #2:GOTO 230
SNJ 280 GOSUB 290:EDIT=0:GOTO 320
HSJ 290 POKE 84,6:RESTORE 310:FOR J=1 TO 4:GOSUB 220
MFJ 300 READ A$:GOSUB 640:PRINT A$:PRINT :PRINT :NEXT J:GOSUB 1030:RETURN
GRJ 310 DATA FULL NAME,ADDRESS,CITY/STATE/ZIP,CATEGORY
OKJ 320 X=0:POKE 84,5:PRINT B$;:Y=PEEK(84)
QIJ 330 POKE 694,0:CC=CC+1:M=0:IF PEEK(84)=14 THEN M=24
ODJ 340 GET #1,K:IF KB$(K,K)="K" AND PEEK(85)<34-M+(K=155) THEN PRINT CHR$(K);
QIJ 350 IF K>64 AND K<123 THEN 330
HFJ 360 IF K=27 AND EDIT=1 THEN RETURN
SJJ 370 IF K=27 THEN 130
YTJ 380 IF (K=60 OR K=62) AND EDIT=1 THEN TRAP 880:RETURN
KLJ 390 IF PEEK(85)>34-M THEN POKE 85,34-M:PRINT B$;
ODJ 400 IF (K=126 OR K=30) AND PEEK(85)=34-M THEN POKE 85,34-M:PRINT CHR$(K);
RVJ 410 Y=Y-(K=28)*3:Y=Y+(K=29)*3:Y=Y+(K=155)*3:IF Y<4 OR Y>14 THEN Y=PEEK(84)
BIJ 420 IF Y<>PEEK(84) THEN POKE 84,Y:PRINT B$;
KTJ 430 IF PEEK(84)=14 AND PEEK(85)>10 THEN POKE 85,10:PRINT B$;
ULJ 440 IF K<255 THEN 460
ATJ 450 X=PEEK(85):POKE 85,34-M:PRINT CHR$(254);:POKE 85,X:PRINT B$;
CLJ 460 IF K=156 THEN PRINT CHR$(157);
TBJ 470 IF PEEK(84)=15 AND EDIT THEN GOTO 320
QHJ 480 IF PEEK(84)=15 THEN NAME$=SP$:ADDR$=SP$:CAT$=SP$:CSZ$=SP$:GOTO 500
BSJ 490 GOTO 330
YVJ 500 POKE 84,5:INPUT #4;NAME$:POKE 84,8:INPUT #4;ADDR$
XIJ 510 POKE 84,11:INPUT #4;CSZ$:POKE 84,14:INPUT #4;CAT$
NEJ 520 IF LEN(NAME$)<32 THEN NAME$(32)=SP$
NTJ 530 IF LEN(ADDR$)<32 THEN ADDR$(32)=SP$
JNJ 540 IF LEN(CSZ$)<32 THEN CSZ$(32)=SP$
EFJ 550 IF LEN(CAT$)<8 THEN CAT$(8)=SP$
DAJ 560 IF EDIT=1 THEN POINT #2,IS,IB
GGJ 570 NOTE #2,S1,B1:PRINT #2;S;L$;B;L$;NAME$;L$;ADDR$;L$;CSZ$;L$;CAT$
MNJ 580 IF EDIT=1 THEN RETURN
EWJ 590 S=S1:B=B1
EUJ 600 POKE 84,21:PRINT "MORE NAMES (Y/N)?";:GET #1,Q:IF Q=89 THEN 630
WWJ 610 OPEN #5,8,0,FILE2$:PRINT #5;S;L$;B;L$;:NOTE #2,S,B
OIJ 620 PRINT #5;S;L$;B;L$:CLOSE #5:CLOSE #2:GOTO 130
QQJ 630 PRINT CHR$(125);:GOTO 280
DLJ 640 FOR I=1 TO LEN(A$):A$(I,I)=CHR$(ASC(A$(I,I))+128):NEXT I:RETURN
BSJ 650 TRAP 670:OPEN #2,12,0,FILE$:NOTE #2,IS,IB:TRAP 40000
QVJ 660 CLOSE #5:OPEN #5,4,0,FILE2$:INPUT #5;FS,FB,FS,FB:GOTO 680
PWJ 670 PRINT "ERROR #";PEEK(195):GOTO 1020
FWJ 680 POKE 84,19
RJJ 690 PRINT "CYCLE OR SEARCH (C/S)?";:GET #1,Q:IF Q=83 THEN SE=1:GOTO 720
LTJ 700 PRINT CHR$(Q);:IF Q<>67 THEN PRINT CHR$(156);:GOTO 680
LGJ 710 PRINT :SE=0
KQJ 720 IF SE=1 THEN GOSUB 890
WEJ 730 PRINT "PRESS > TO MOVE FORWARD":PRINT "PRESS < TO MOVE BACKWARD"
EQJ 740 GOSUB 290
FDJ 750 ST=IS:BT=IB:NOTE #2,IS,IB:INPUT #2;S,B,NAME$,ADDR$,CSZ$,CAT$
DJJ 760 POKE 85,2
RIJ 770 POKE 84,5:PRINT NAME$:POKE 84,8:PRINT ADDR$:POKE 84,11:PRINT CSZ$
IUJ 780 POKE 84,14:PRINT CAT$
EMJ 790 POKE 84,3:PRINT SP$
IOJ 800 CC=0:EDIT=1:GOSUB 320
HWJ 810 IF CC>1 THEN POKE 85,2:POKE 84,15:PRINT B$;:GOSUB 480
SJJ 820 IF K=27 THEN 130
ECJ 830 IF K=60 AND (S>=0 OR B>=0) THEN POINT #2,S,B:GOTO 750
JTJ 840 IF K=62 THEN NOTE #2,S1,B1:IF S1<>FS OR B1<>FB THEN 750
NCJ 850 IF K=62 THEN A$="LAST NAME IN FILE":GOTO 1010
NKJ 860 IF K=60 AND S+B<0 THEN A$="FIRST NAME IN FILE":GOTO 1010
BWJ 870 GOTO 800
PFJ 880 TRAP 40000:PRINT "ERROR #";PEEK(195):GOTO 1020
RDJ 890 POKE 85,2:PRINT E$;"SEARCH BY FULL NAME OR LAST (F/L)?";
OAJ 900 GET #1,Q:IF Q<>76 AND Q<>70 THEN 890
JWJ 910 POKE 85,2:PRINT E$;"SEARCH FOR WHAT NAME";:INPUT A$
OVJ 920 POINT #2,IS,IB:TRAP 1000
OQJ 930 NOTE #2,ST,BT
OCJ 940 INPUT #2;S,B,NAME$,ADDR$,CSZ$,CAT$
IEJ 950 IF Q=70 THEN IF NAME$(1,LEN(A$))<>A$ THEN 930
TGJ 960 IF Q=70 THEN 990
NGJ 970 FOR I=1 TO LEN(NAME$):IF NAME$(I,I)<>CHR$(32) THEN NEXT I:GOTO 930
IJJ 980 TRAP 930:IF NAME$(I+1,I+LEN(A$))<>A$ THEN 930
YTJ 990 PRINT "FOUND":POINT #2,ST,BT:RETURN
BOJ 1000 PRINT "NOT FOUND":GOTO 1090
UVJ 1010 POKE 85,2:POKE 84,3:GOSUB 640:PRINT A$:GOTO 800
FNJ 1020 FOR I=1 TO 500:NEXT I:GOTO 130
IRJ 1030 POKE 84,23:A$="PRESS ESC FOR MENU":GOSUB 640:PRINT A$;:POKE 85,2:RETURN
INJ 1040 TRAP 1090:OPEN #2,4,0,FILE$:OPEN #5,4,0,FILE2$:INPUT #5;I,I,FS,FB
SIJ 1050 NOTE #2,S,B:INPUT #2;I,I,NAME$,ADDR$,CSZ$,CAT$
UVJ 1060 IF CAT$(1,7)="DELETED" THEN PRINT "*";
UWJ 1070 PRINT NAME$:IF PEEK(764)=28 THEN 1100
FGJ 1080 GOTO 1050
BRJ 1090 PRINT :GOSUB 1030
TJJ 1100 GET #1,Q:IF Q<>27 THEN 1100
DCJ 1110 GOTO 130
QEJ 1120 NAME$=NUL$:NAME2$=NUL$
FBJ 1130 PRINT E$;"NUMBER OF LABELS ACROSS (1/2)?";:GET #1,Q:? CHR$(Q);
PHJ 1140 IF Q<49 OR Q>50 THEN 1120
FQJ 1150 Q=Q-49:PRINT :IF Q=0 THEN 1170
QCJ 1160 PRINT :PRINT "SPACING BETWEEN HORIZONTAL":PRINT "LABELS (6)";:INPUT HS
JVJ 1170 PRINT :PRINT "SPACING BETWEEN VERTICAL":PRINT "LABELS (4)";:INPUT VS
QVJ 1180 CAT2$=SP$:PRINT :PRINT "CATEGORY (ALL)";:INPUT CAT2$
VDJ 1190 IF CAT2$<>"ALL" THEN IF LEN(CAT2$)<8 THEN CAT2$(8,8)=CHR$(32)
SSJ 1200 PRINT :PRINT "TURN PRINTER ON AND POSITION LABELS."
FPJ 1210 A$="PRESS RETURN WHEN READY":GOSUB 640:PRINT A$;
UWJ 1220 INPUT #1;A$:OPEN #5,8,0,"P:"
TZJ 1230 TRAP 1330:OPEN #2,4,0,FILE$
PSJ 1240 INPUT #2;S,B,NAME$,ADDR$,CSZ$,CAT$
MRJ 1250 IF CAT2$<>"ALL" AND CAT$<>CAT2$ THEN 1240
FRJ 1260 IF CAT$(1,7)="DELETED" THEN 1240
IYJ 1270 IF Q=0 THEN NAME2$=NAME$:ADDR2$=ADDR$:CSZ2$=CSZ$:GOTO 1290
VWJ 1280 IF LEN(NAME2$)=0 THEN NAME2$=NAME$:ADDR2$=ADDR$:CSZ2$=CSZ$:GOTO 1240
LRJ 1290 PRINT #5;NAME2$;:IF Q THEN PRINT #5;SP$(1,HS);NAME$;:NAME$=NUL$
TKJ 1300 PRINT #5;L$;ADDR2$;:IF Q THEN PRINT #5;SP$(1,HS);ADDR$;:NAME2$=NUL$
LOJ 1310 PRINT #5;L$;CSZ2$;:IF Q THEN PRINT #5;SP$(1,HS);CSZ$;
FLJ 1320 FOR I=1 TO VS:PRINT #5:NEXT I:GOTO 1240
VRJ 1330 IF LEN(NAME$)*LEN(NAME2$)*Q=0 THEN 130
PSJ 1340 NAME$=NUL$:TRAP 1330:Q=0:GOTO 1290
WFJ 1350 OPEN #5,6,0,"D:*.*"
ICJ 1360 INPUT #5;A$:IF A$(1,1)=CHR$(32) THEN 1360
BSJ 1370 PRINT A$:GOTO 1090

[END OF LISTING]
```


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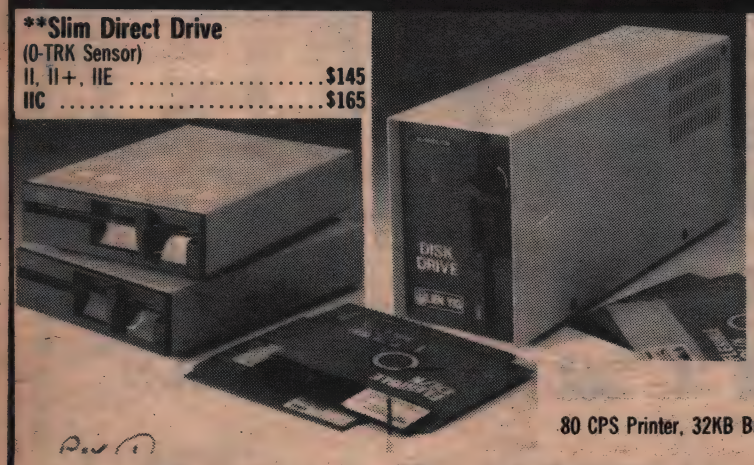

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Berserker Raids
Continued from page 87

Cluster," for example, which reads as follows:

Ships of Player One are arriving at a world (at Star Nine) held by Player Two. A quick decision must be reached on whether to fight, or to ally against berserkers.

Yes - that's the entire "scenario."

Documentation

A partially redeeming feature of this package is the 64 pages of documentation. The manual gives you adequate preparation for game play by taking you through the steps of a sample game. The clearly defined terminology used for the ships and bases makes most of the documentation easy to understand.

Graphics? Sound Effects?

The big question on this game is "What happened to the graphics?" Why would a game with a space-war theme released in 1985 not employ at least low-resolution graphics (let alone color) nor sound-effects? Apparently the authors realized their negligence in this area as they added a short shoot-'em-up sequence with high resolution, color graphics as an introduction to the game. After that first screen, though, it's black and white and asterisks and plusses for the remainder of the game. Color graphics could have been applied nicely to this program: to the maps, the various ships, the ensuing berserkers, etc. Yet, for one reason or another, the graphics were left out. As is, the game could have conceivably come right out of a **Creative Computing** magazine listing of five years ago. Sure, the game is stimulating in some respects without the graphics and sound, but for $34.95 we should expect a lot more.

Some other not-so-good comments: The game, or at least the Atari version used for this review, is written in BASIC and hence is often irritatingly slow. Occasionally, I found myself hitting the keyboard when screen changes were taking too much time.

In short, **Berserker Raids** is slick packaging and substantial documentation but, alas, a game that is slow, primitive, and lacking in features that make a game worth $34.95. Perhaps the "THANK YOU FOR PLAYING" message displayed at the end of the game best confirms my conclusions. A game shouldn't have to thank you for playing; a truly invigorating game will have you thanking it.

Ratings

Design *
Amusement level **
Documentation ***
Value *
Average *½

*½

Requirements:

Atari 400/800/XL: 48K, BASIC, and disk drive.

Apple II, II+, IIe: 48K and disk drive.

IBM-PC: 64K, Monochrome or Color Video Board, Dos 1.0, 1.1 or 2.0, and disk drive.

Commodore 64: Disk Drive.

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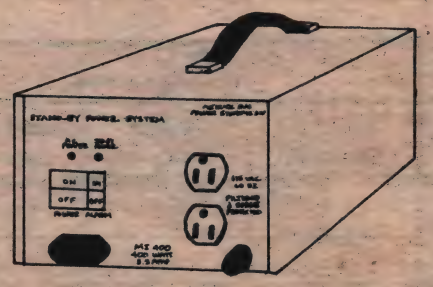

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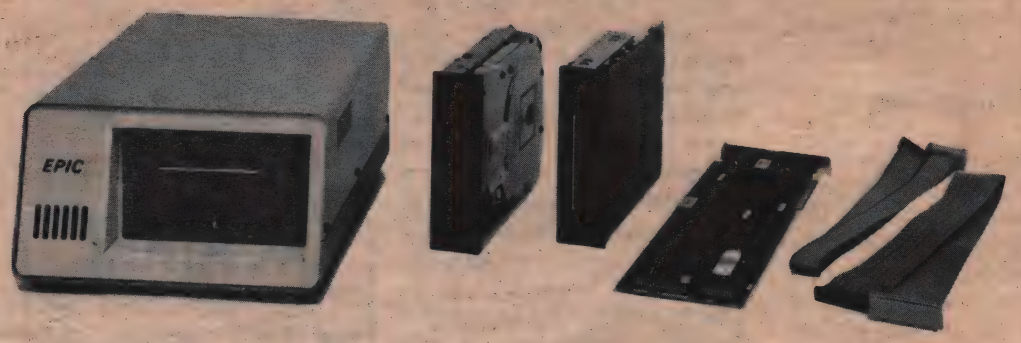

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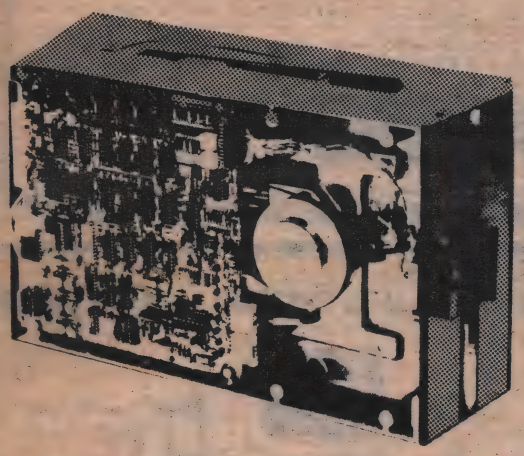

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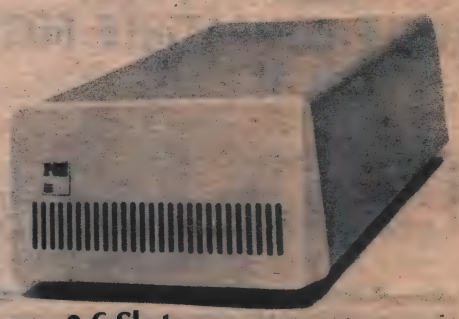

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Disk Formats

Continued from page 50

the cracks" between the tracks.

Michtron, admitting that this is not an acceptable solution, does not permit the otherwise outstanding DSDOS plus from attempting to format disks in this manner. Quad drives are limited to either a 400k (one side) or 800k (double sided) format. For this reason, it is popular to create a system with at least one Double Density drive on hand, in case copies need to be made which will be used on a non-quad system. Both Tim Purves (author of DSDOS plus) and the present author use a system with one DSDD (TEAC 55B) and one DSQD (TEAC 55F) this gives 400k storage on one drive, and 800k storage on the other. DSDOS plus format utility will sense the type of drive being used and present a menu with a range of possible formats for that drive. It is rather like a watered down XT arrangement, except that normal functions such as DISKCOPY will work, as long as you are going in the right direction.

If you are considering the purchase of a Sanyo consider carefully the advantages and disadvantages of the Quad machines. It is no catastrophe if you purchase a system with a DOS which loses out on the race to become the single standard—all you are betting is a $50 piece of software, as the hardware is identical in all these systems. Double Density for the 5¼ inch floppy will always be the standard of the IBM PC at this point, but all of the operating systems discussed will read diskettes in this format just fine. It has been reported that Quad systems may be more likely to lose data (reasonable if the same amount of information is being stored in half the space), but we have not observed this very often. Heat is also reported as being a greater problem on quad systems, but the built in Muffin Fan on the Sanyo seems adequate for all but the most extremes of climate.

For the technically minded,

Continued on page 98

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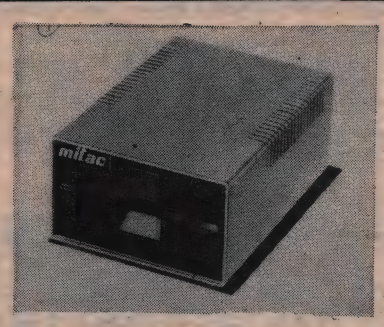

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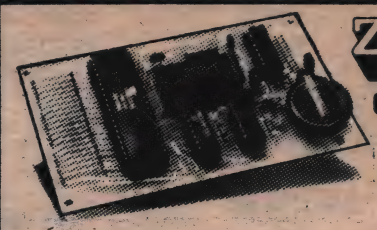

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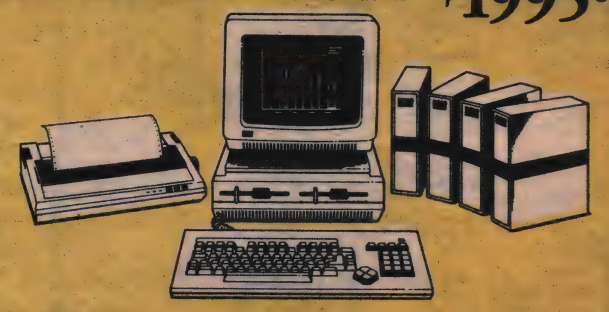

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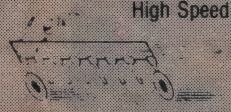

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Disk Formats
Continued from page 96

building your own system may be the best way to assemble the Sanyo right for you. Sometimes purchasing a basic machine and adding your own second drive may save a great deal of money, especially if it doesn't require the additional bundled software which comes with the second drive.

Assuming that you have one of the early Sanyo's and desire more storage capacity, or perhaps want to move up to the Quad format, you can do so quite economically. Remember, your old drives are worth quite a bit of money, as they are usable in many different types of computers: Kaypro, Texas Instruments, Atari, to name a few. There are also Sanyo 550 owners looking for a second drive. You simply need to purchase the appropriate drive and software, and install them. We will describe how to do this now.

One of the most striking things about upgrading your disk drives is that the new drive will look practically identical to the one you are removing. The entire TEAC 55 family shares an almost identical circuit board and case. The quad drives have a different color stepping motor. Swapping a disk drive is very simple, and you need not be an electronic wizard to do it. All you will need is a small phillips head screwdriver.

First unplug the computer and disconnect any peripherals. Remove the 550's case by unscrewing the two screws on each side and the one in the rear (five total). The case will now slide back and up. Looking into the computer you will note that the disk drives are mounted to a metal place which crosses the front of the Sanyo. Remove the four screws (two on each edge of the plate) and the one screw on the right side that attaches a ground strap wire. Next unplug the drives. There is a power connector and a ribbon wire going to each drive. They slide off. It is not possible to disconnect any of these things backwards or upside down, so don't worry.

At this point the drives will lift out of the Sanyo. You may replace one or both of the drives by removing the four screws holding it to its place.

Before re-assembling the Sanyo with it's new drives, you need to check the Drive Straps. If you are an IBM snob, you may want to set the straps so that the "A" drive is on the left rather than the Japanese standard of on the right. Which drive a drive will attempt to be is determined by a small resistor pack on the bottom of the drive. What is absolutely critical is that no two drives are set at the same setting, and that one is set at "DSO," or to be Drive "A." At the bottom right of the drive, you will see a row of pins, some of which have little black clips on them. What these pins signify is written beside them. A clip on "DSO"

Continued on page 100

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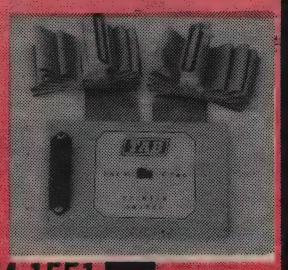

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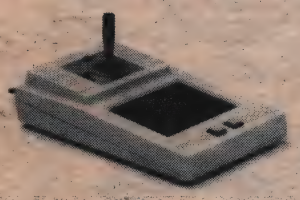

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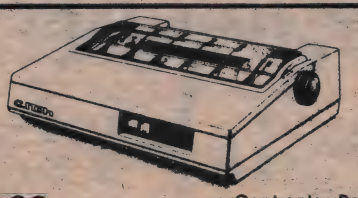

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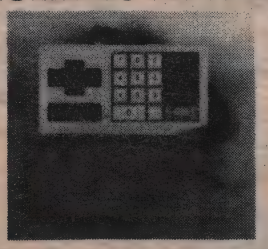

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Disk Formats
Continued from page 98

will produce a drive "A," "DS1" drive "B," and so on. Remember, all drives from the factory come set up to be drive "A"; therefore if you are adding either a pair or a "B" drive, you will need to move a strap. Re-assemble the unit by following the above steps in reverse.

Software

Unless you have added another of the same drive type you had, you will now likely need a new operating system. Michtron's DSDOS plus is probably the most flexible, as it will support any drive from 160 to 800k with no modification. It also has some very nice utility features, such as a menu driven Format program. The advantage of AOK DOS is it's screen dump program, which is an optional program for Michtron. Incidentally, when you buy a Silver Fox, you are getting "Hagen DOS" which is AOK DOS renamed as a pun on the ice cream. AOK offers four grades of modified DOS, and you would need to select the one for your application. Greywolf's system is widely marketed as a software only package. It is found on their "Super System," a package similar to the Silver Fox from Scottsdale. It is the least common of the three systems.

A key element in forming your decision should be the base on which the modified DOS is built. MS DOS 1.25 is faster in some areas, because it is a smaller program, but lack commands needed for certain pieces of software. For this reason a DOS 2.11 based system is to be preferred.

With a little care in configuring your system, it will become clear that the Sanyo now offers more latitude in floppy disk storage capacity than is to be found on the IBM, and that it is possible to configure the system that you want for less than you might have thought it would cost. ●

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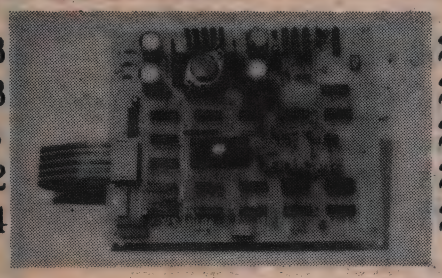

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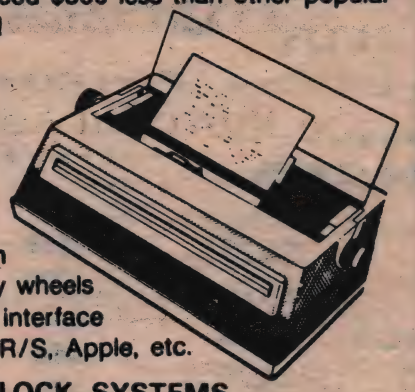

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TRSDOS Topics
Continued from page 52

are being added to the HC according to the note in the docs I used. The unit is being made more "user friendly" at this time. If it gets more user friendly it will hold your hand and smile at you. I had no problems using the HC. The only snag I was able to find was in the LISTING SCHEDULE option and that isn't much. When the list is displayed with 10 to 16 commands in the program the top of the list is scrolled off the screen when the menu appears. You have to read fast. With more than 16 commands the listing pauses and waits for an "M" to be entered before the listing continues.

At first I was put off by the cost of the modules. The ones I found were in the neighborhood of $16.00. Then I considered what I was using in their place now and how much they cost. I would replace two $45 timers and three $18 photo cells. In the long run I would save money and have a lot more flexibility. Of course if you don't already have a computer the cost factor would be out of sight.

The possibilities for use of the HC are endless. Construction is excellent and operation faultless. I've put it on my want list for home and in the lab where I work.

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MAY 1985

MAY 1-2
Central NY Office/Computer Expo, Syracuse, NY. Call 716-834-9431 for more information.

MAY 1-2
Wichita Computer Expo, Wichita, KS. Call Industrial Presentments for more information 303-696-6100.

MAY 2-4
Byte Computer Show, Anaheim, CA. Call The Interface Group for more info, 617-449-6600.

MAY 6-9
COMDEX, Spring '85. Atlanta, GA. Call The Interface Group for more info, 617-449-6600.

MAY 15-19, 1985
The Washington, D.C. Byte Show will be held in the Washington Convention Center. For more information call The Interface Group at 617-449-6600.

MAY 16-19
Computer Showcase Expo, Washington, D.C., call The Interface Group for more info, 617-449-6600.

MAY 17-19
Rainbowfest, Chicago, IL. Call Falsoft, Inc. for more info, 502-228-4492.

MAY 18, 1985
THE 8TH ANNUAL SHOW & TELL MICROCOMPUTER CONFERENCE will be held at the University of Oklahoma in Norman, OK. The conference brings together microcomputer buffs of all ages and degrees of expertise. For more information and application forms, send a self-addressed, stamped envelope to Show & Tell Computer Conference, Richard V. Andree, O.U. Math Dept., 601 Elm, Norman, OK 73019.

MAY 19,1985
The Iliana Repeater System 16th Annual Hamfest will be held in the UAW Civic Center. For more information call Barbara Tolson at 217-662-8948.

MAY 22-24
Byte Computer Show, Boston, MA. Call The Interface Group for info, 617-449-6600.

JUNE 1985

JUNE 2-5
Consumer Electronics Show/Summer. Chicao, IL. Call CES for more info, 312-861-1040.

JUNE 3-6
Robots 9, Cobo Hall, Detroit, MI. Call 215-384-7262 for more information.

JUNE 6-9
Computer Showcase Expo, Dallas, TX. Call The Interface Group for more info, 617-449-6600.

JUNE 6-9
Computer Showcase Expo, Seattle, WA. Call Interface Group for info, 617-449-6600.

JUNE 11-3
Government Computer Expo, Sheraton Washington Hotel, call 301-695-9562 for info.

JUNE 12-14
PC World Exposition, San Diego, CA. Call Mitch Hall Assoc. for info, 617-329-7466.

JUNE 13-16
Computer showcase Expo, Philadelphia, PA. Call The Interface Group for info, 617-445-6600.

JUNE 17-19
3rd Annual PC Expo, New York, NY. Call 1-800-922-0324 for more information.

JUNE 20-23
Computer Showcase Expo, Milwaukee, WI. Call The Interface Group for info, 617-449-6600.

JUNE 25-27
Computer Graphics '85 West, Los Angeles, CA. Call 703-698-9600 for more info.

JULY 1985

JULY 15-18
1985 National Computer Conference, Chicago, IL. Call AIFPS for info., 703-620-8900.

JULY 25-28
Computer Cornucopia Magazine, Workshop & Outdoor Recreations in Oregon. No charge for workshop, nominal charge for rafting, etc. For information call Dorcas Osensis, 503-382-8048 before July 1, 1985.

AUGUST 1985

AUGUST 13-15
Computer Graphics '85 East, Boston, MA. Call 703-698-9600 for more information.

AUGUST 21-23
MacWorld Exposition, Boston, MA. Call Mitch Hall Associates for info., 617-329-7466.

SEPTEMBER, 1985

SEPTEMBER 4-6
National Software Show, Washington Convention Center, Washington, D.C. Call Sam Slack at 609-848-1000 for info.

SEPTEMBER 5-7
Byte Computer Show, Dallas, TX, call the InterFace Group at 617-449-6600 for info.

SEPTEMBER 11-13
PC World Exposition, Toronto, Canada, contact the Mitch Hall Association at 617-329-7466.

SEPTEMBER 12-15
Tampa Bay Computer Show, Curtis Hixon Convention Center, Tampa, call CompuShows, Inc. at 301-263-8044 for info.

SEPTEMBER 19-21
Byte Computer Show, NY, NY, contact the InterFace Group at 617-449-6600.

NOVEMBER 1985

NOVEMBER 10-13, 1985
The Ninth Annual SYMPOSIUM ON COMPUTER APPLICATIONS IN MEDICAL CARE will be held at the Baltimore Convention Center. It will offer a forum for professionals from both the health care and computers fields to come together, to listen to exchange ideas, to learn from each other and to leave with some new insight into solving problems in medical computing. For further information contact SCAMC, The George Washington University Medical Center, Office of Continuing Medical Education, 2300 K St., N.W., Washington, D.C. 20037.

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Great For All Languages

A general purpose text processor, the MIX Editor is packed with features that make it useful with any language. It has auto indent for structured languages like Pascal or C. It has automatic line numbering for BASIC (255 character lines). It even has fill and justify for English.

Terminal Configuration

A utility for defining terminal features (smart features included) allows the editor to work with any terminal. Over 30 of the most popular terminals are built-in.

Custom Key Layouts

Commands are mapped to keys just like WordStar. If you don't like the WordStar layout, simply change it. Any key can be mapped to any command. You can also define a key to generate a string of characters, great for entering keywords.

Split Screen

You can split the screen horizontally or vertically and edit two files simultaneously.

Macro Commands

The MIX Editor allows a sequence of commands to be executed with a single keystroke. You can define a complete editing operation and perform it at the touch of a key.

Custom Setup Files

Custom keyboard layouts and macro commands can be saved in setup files. You can create a different setup file for each language you use. The editor automatically configures itself using a setup file.

Command Mode

Command mode allows any editor command to be executed by name. It is much easier to remember a command name versus a complicated key sequence. Command mode makes it easy to master the full capability of the editor. Frequently used commands can be mapped to keys. Infrequent commands can be executed by name.

Editor Commands

The editor contains more than 100 commands. With so many commands, you might think it would be difficult to use. Not so, it is actually extremely simple to use. With command mode, the power is there if you need it, but it doesn't get in your way if you don't. Following is a list of some of the commands.

Cursor Commands

Left/Right/Up/Down
Tab Right/Tab Left
Forward Word/Backward Word
Beginning of Line/End of Line
Scroll Up/Scroll Down
Window Up/Window Down
Scroll Left/Scroll Right
Top of File/Bottom of File
• • •

Block Commands

Copy/Move/Delete
Read/Write
Lower Case/Upper Case
Fill/Justify
Print

File Commands

Directory (with wild cards)
Show File/Help File
Input/Output File
Delete File/Save File

Other Commands

Split Screen/Other Window
Find String/Replace String
Replace Global/Query Replace
Delete Line/Undelete Line
Delete Word/Undelete Word
Insert Mode/Overwrite Mode
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In other words, when people buy a more expensive diskette, they aren't necessarily buying higher quality.

The extra money might be going toward flashier advertising, snazzier packaging or simply higher profits.

But the extra money in a higher price isn't buying better quality.

All of the good manufacturers put out a good diskette. Period.

How to cut diskette prices ...without cutting quality.

Now this discovery posed a dilemma: how to cut the price of diskettes without lowering the quality.

There are about 85 companies claiming to be "diskette" manufacturers.

Trouble is, most of them aren't manufacturers.

Rather they are fabricators or marketers, taking other company's components, possibly doing one or more steps of the processing themselves and pasting their labels on the finished product.

The new Eastman Kodak diskettes, for example, are one of these. So are IBM 5¼" diskettes. Same for DYSAN, Polaroid and many, many other familiar diskette brand names. Each of these diskettes is manufactured in whole or in part by another company!

So, we decided to act just like the big guys. That's how we would cut diskette prices...without lowering the quality.

We would go out and find smaller companies to manufacture a diskette to our specifications...specifications which are higher than most...and simply create our own "name brand" diskette.

Name brand diskettes that offered high quality at low prices.

Super Star diskettes are sold in multiples of 50 only. Diskettes are shipped with white Tyvec sleeves, reinforced hubs, user ID labels and write-protect tabs.

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In our search for the low priced, high quality diskette of our dreams, we found something even more interesting.

We found that there are several manufacturers who don't give a hoot about the consumer market for their diskettes. They don't spend millions of dollars in advertising trying to get you, the computer user, to use their diskettes.

Instead, they concentrate their efforts on turning out the highest quality diskettes they can...because they sell them to the software publishers, computer manufacturers and other folks who (in turn) put their name on them...and sell them for much higher prices to you!

After all, when a software publisher or computer manufacturer or diskette marketer puts their name on a diskette, they want it to work time after time, everytime. (Especially software publishers who have the nasty habit of copy-protecting their originals!)

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Super Star Diskettes are good. So good that a lot of major software publishers, computer manufacturers and other diskette marketers buy them in the tens or hundreds of thousands.

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Cheap.

When every little bit counts, it's Super Star Diskettes.

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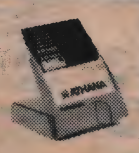

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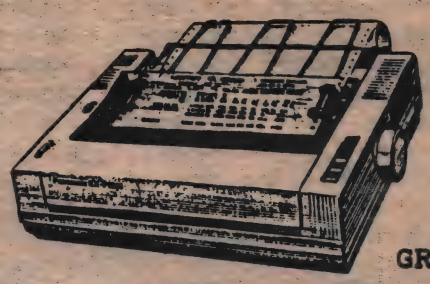

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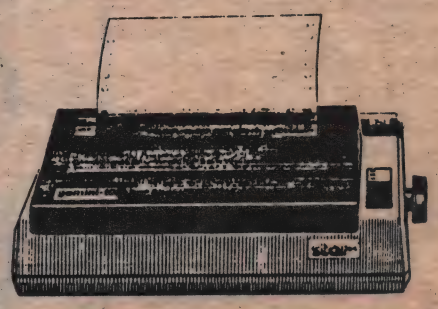

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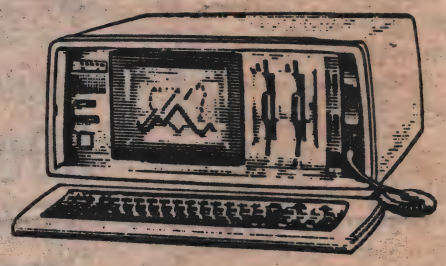

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Short Circuit
Continued from page 40

tions included with the game and see if you agree:

"Device ZX88B -- mistakenly activated during a moment of feverish international tensions -- is about to trigger twenty Doomsday Bombs from a series of enemy satellites encircling the Earth! The world holds its breath as you are assigned to disarm THE DEVICE before it DETONATES the bombs."

That's not all. The game is complete with a little graphics routine showing the Earth explode when three detonation pulses are sent. Like I said --it's depressing. But this game really is a lot of fun. The graphics and sound effects are first rate. When the disc is first booted a short demo program shows twelve microcircuits you must disarm. A tap of the space bar begins the game and provides you with a choice of the first two microchips. Through a newly developed shrinking technology, you are reduced to an electron as you enter the circuit of your selection. Once inside, you must turn the system's power against itself. This is no easy task. Throughout the game you are dodging neutrons, double neutrons, photons and other various particles that really shouldn't be floating about freely inside electronic circuits, (but then you shouldn't be jumping about the circuit wires as an electron either).

The rules of the game are easy to master. Each circuit is made up of several different components. You are the ELECTRON. With the joystick, you move within the microcircuits and must disarm the microcircuits without allowing the microfuses to connect. Each time a microfuse connects, a DETONATION pulse is sent. Three pulses will begin the DOOMSDAY attack to blow up the Earth and end the game. (Depressing isn't it?) Another component on the microcircuit is the MICROBATTERY. Use the power voltage stored in the batteries to overload and disarm the microchip. As an electron, you move to a battery and send power until one of the batteries becomes overloaded with power voltage. When the overloaded battery begins to flash, you must reach the battery without being hit. Accomplishing this task causes the circuit to blow and keeps it from sending pulses. Now the Lightning Run begins and bonus points are collected. After the Lightning Run, enter another circuit and continue until all twelve microchips are disarmed. The elements of the microcircuit to avoid are the NEUTRONS, DOUBLE NEUTRONS, and PHOTONS. Being hit by one of these particles drains the energy from the batteries and will alert the Doomsday Device of your presence. MICROSPARKS increase the voltage on the batteries by sending a power surge through the circuit. Prevent the left and right sides from connecting at all costs. Contact sends a detonation pulse to the Device. There are twelve microcircuits in all and they range from bouncing neutrons to photon diamonds. Each circuit increases in difficulty and each has its own style.

Short Circuit is written by David Schroder for MicroLab, Inc. who distributes it. The cost is $20. It is evident from playing the game that much effort when into designing and writing the program. Response is quick and the game moves fast. Well worth the money. ●

Feedback
Continued from page 15

machines were really amazing — they would mill, drill and machine metal to tolerance of 1/1000 of an inch. I got to work on some of these machines which likely accounts for my interest in computers.

I also enjoyed your article P.C. are 10 years old. Most other magazines are all about the same — just information about software and recent PCs. What I really like is information on 2nd and 3rd generation computers and business systems.

By the way — the company had bought some of the Japan made machine tools that were run by computers but these were inferior to the American machines — they were not heavy enough for the work we were doing.

I am sure your readers would find articles about any machines run by computers — take copiers for example — technology on these is high and some of the new ones are amazing.

About this time IBM came out with the 370/ - 165 that sold for over $4½ million and rented for almost $100,000 a month.

Well, keep up the good work on the history of computing, and good computing.

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●

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How Well III
Continued from page 56

short time. The most frequently read data on a disk is the system data that tells DOS what is being used and where that information is on the disk. If this information is in a RAM oriented BUFFER, it can be used at electronic speed without using the time to go back to the disk to locate the data and read it into memory again. Therefore, we can conclude that for MOST applications (remember our definition of "through-put"), the larger the disk buffer we use the greater the chances are that the information that DOS needs will be waiting in the disk buffer and thereby reduce the overhead I/O processing time! Is that clear to the readers?

Knowing this helps put the trade off decisions in better perspective. A few months back most of the MS-DOS users believed that if the computer had 128 or 192K of RAM that our set-up was really in good shape. Afterall, most of us had been using a COLOSSAL 64K of RAM with our H8 or H/Z-89 computers. But, I think that most of us soon found that the software was using this 128 or 192K of RAM so fast that there wasn't any memory left for program data and certainly nothing left for large disk buffers. Therefore, most of us started adding in memory to these new computers. Fortunately, at the same time the cost of RAM chips dropped in price!

To conclude the discussion about disk buffers for now I would like to suggest the following sizes to the readers:

1) With floppy disk drives try 2 to 4 buffers.
2) With 10-megabyte hard disk drives use 10 to 20.
3) With 20-megabyte hard disk drives use 20 to 30.

The reason I suggested a range of disk buffers is that we have the difference in default size between the H/Z-100 and H/Z-100-PC as I covered above and also to provide some room for users to decide on the relative importance of RAM vs disk storage space (remember trade off and application differences). The user should experiment with performance tests to determine what is BEST for the computer and the main applications being used. I cannot repeat this too many times as that is the KEY to this phase of the discussion!

I guess now is the time to start the discussion of the next best bet that can be done to increase through-put! This is the use of memory or RAM disk! How many readers have used RAM disks? (Notice - while I have discussed the hard disk because it was necessary to consider in the trade off discussion for disk buffers, I am not going to suggest adding a hard disk just to increase through-put! That is down a little in priority because they are expensive to add and NOT all user applications require them.) Varying the disk buffer size really did not increase the cost of the computer directly. It was only a trade off of how we would balance the available RAM size vs disk storage size. Using a RAMdrive does not have to increase the cost of the computer directly, but in most cases I believe that the user will end up adding RAM size which will add to cost. But this will be done as much for the application software as for the RAMdrive. The reason that I say this is that most of us are adding the new spreadsheet programs that take an awful lot of memory whether the user is going to use a RAMdrive or not. RAMdrives do not have to be large (I would not suggest less than 64K though) to increase through-put a LOT!

For an example, if the reader were to use WordStar with its overlay files and use a RAMdrive for the .OVR files (64K is enough), it would result in an increase of through-put by an incredible amount. Please try it if the software is available! Another example, if the application were an accounting system with a data file that uses random files, the use of a RAMdrive for the data files could reduce an update session of 10 to 15 minutes to 2 or 3 minutes! That is dramatic! I will leave the discussion of the actual testing for the concluding portion of the through-put subject.

There are two basic types of memory (RAM) disks:

1 - The disk driver type loaded by the DEVICE = MDISK.DVD command in the CONFIG.SYS file.

2 - The DOS memory disk program; such as those supplied by many of the third party multi-function add-on boards.

Both types are very useful and work about the same way. I use both. The disk driver type is automatically loaded when the system is booted by the MS-DOS system loading the CON-

Continued on page 108

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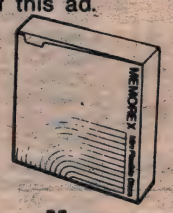

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Ask The Guru
Continued from page 39

And don't let them catch on. Keep all requests very professional and business-like. If they didn't want you to have a free 6502, they wouldn't have said so in so many of their full page ads.

Anyway, most of the compatibility problems lie in the new character generator chip. An area of the chip has been set aside to hold a "mouse nest" of what are called mouse characters. But this misses the point. The real use of the mouse nest is that you can now do pull-down or pop-up menus on the stock text screen, letting you pick up all sorts of Mac-like features.

So, for future use, the upgrade is a great idea. What can you do here and now to live with it?

Use this key rule: Make EPROM backup copies of all your firmware!

Do this BEFORE you make the upgrade.

Program one is an Applesloth routine called SNATCHMON that will automatically capture your existing monitor ROMs to disk, under filenames of IIEMON.C, IIEMON.D, IIEMON.E, and IIEMON.F. These are purposely left in four pieces so that an older EPROM burner can be used if you know what you are up to. Normally, the C and D code goes into one 2764 EPROM, while the E and F code goes into a second 2764.

One prompt and low cost source of EPROM program ming is **E-Tech services**. More details appear in my absolute reset package from Synergetics.

Capturing the character generator ROM code is a little trickier. The easiest way is to borrow an EPROM programming card and another Apple, put the character generator into the EPROM burn socket and read the ROM code back to disk. A 2732 EPROM can later be used to clone this ROM.

Note that an EPROM programming service cannot legally sell you ready-to-run EPROMs unless you first send them your disk based copy of your code to be burned. You must send them the code, and not vice versa.

Figure two, see page 116, shows us a way to have the best of both worlds. With a simple adaptor and a hand-burned double sized 2764 character generator EPROM, you can use either the old or the new character generator at the flip of a switch. This gives you an ehanced generator for new stuff, and an old one for your existing software. Burn a new ROM clone on the bottom 32K and the old clone on the top 32K of a 2764. To use, if anything every looks funny on the screen, just slide the switch to the other position.

Several gotchas: Be sure to use only premium, machined pin contact sockets and strips for your adaptor. Do NOT use a toggle switch! And, of course, unplug BOTH ends of the Apple line cord and rest your hand on the power supply when installing the adaptor. Make sure that the dot and notch points to the front of your machine.

By the way, I have a free CLARIFIER patch that lets you run **Applewriter IIe** on an enhanced IIe or a IIc with minimum problems. I also have a free listing on the changes needed to do an absolute "old monitor" reset on the new IIe. Write or call for details.

Let's briefly run down the reasons your old Apple programs may be incompatible. By far the most common problem is the mouse nest in the character generator. Any screen codes between $40-5F will appear as mouse characters instead of inverse upper case. While there are two possible codings for inverse uppercase on older Apples, the $40-5F range is far more common, especially for software flashing cursors.

The adaptor of figure two will solve these mouse nest problems. If you are a machine language type, it is usually a simple mattter to find the screen routines in your problem code, and trap out anything in the $40-5F range

Continued on page 113

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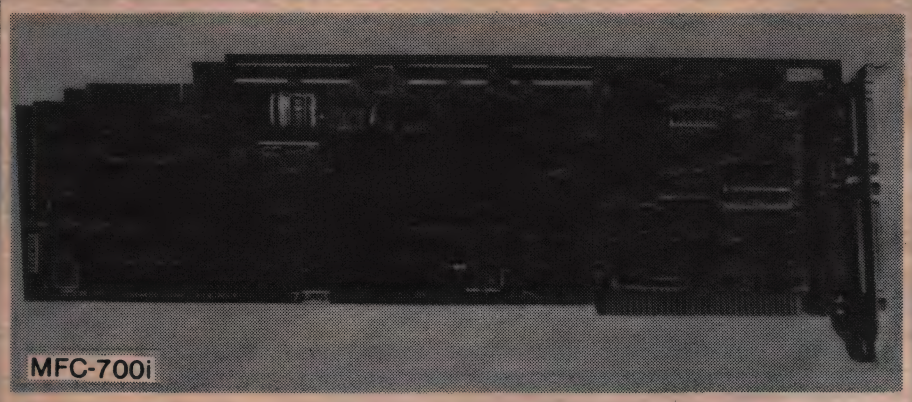
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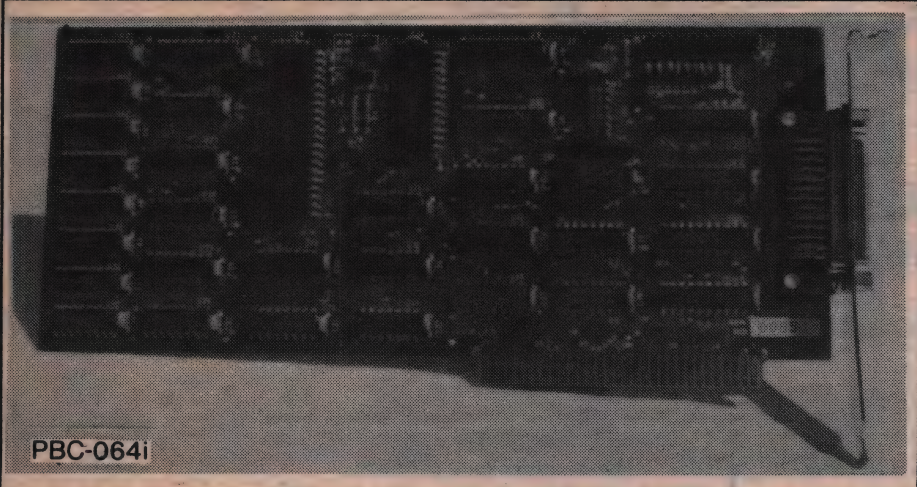
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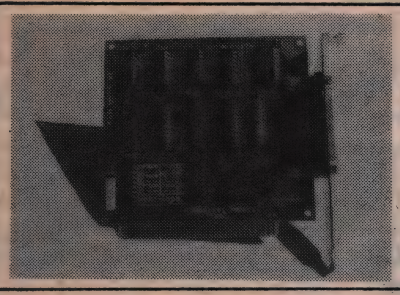
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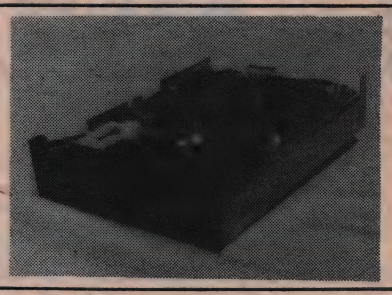
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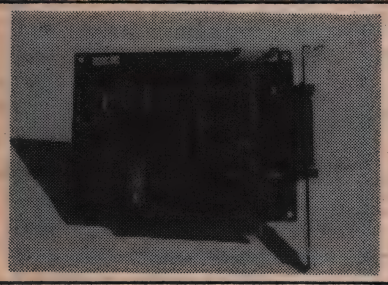
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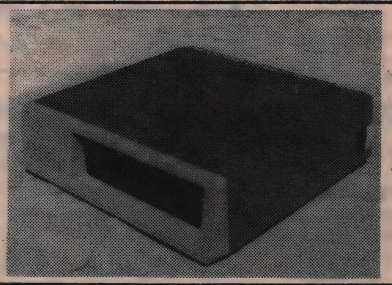
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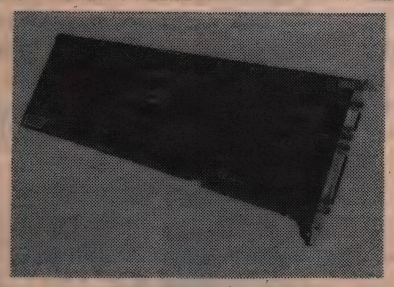
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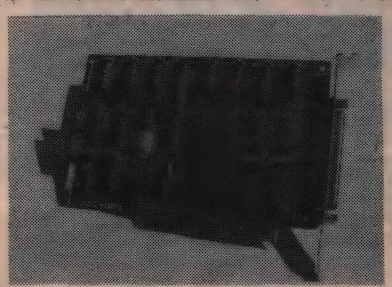
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How Well III
Continued from page 105

FIG.SYS file. The disadvantage of this type is the loss of flexibility. The CONFIG.SYS file must be revised to change the memory disk size and the system then rebooted. Most of the DOS memory disk programs can be changed by redefining the program with new options with a new command line and reloading the program. It can also be automatically loaded by including it in the AUTOEXEC.BAT file!

I am going to use MDISK (from Programmer's Package) as an example of the disk driver type. The file MDISK.ASM is included with the MS-DOS Ver. 2.x Programmer's Package and it can be used with both the H/Z-100 and the H/Z-100-PC computers. The assembled MDISK.DVD included with some MS-DOS manuals is preset for a RAM size of 64K. The user can modify the MDISK.ASM source file to re-assemble the memory disk for larger size RAMdisk. Looking at the .ASM file, the user will find that there is a list of three size optional disk sizes besides the 64K that can be chosen. With this arrangement, the desired RAMdisk size can be chosen when the CONFIG.SYS file is created by the user specifying the desired size. It is not necessary to re-assemble the MDISK.ASM source file for each size. The user will specify the MDISK size in the CONFIG.SYS file by including the following command line:

DEVICE = MDISK.

The xxx can be designated as 64K, 128K, 256K, or 512K as the desired size. Of course, anytime that the reader would want to change this size, the CONFIG.SYS file would have to be revised and the system rebooted! That is the disadvantage of this type of RAMdrive.

Before this size xxx feature can be used, the user will have to assemble the MDISK.ASM source file. The MDISK.DVD presently on some of the distribution disks does not provide for the size = xxx option! I know that many of the readers know how to assemble such a file, but as I have stated many times I would like to write these articles so that readers with all levels of experience can use the material provided in this series. So, I would like to provide a brief explanation of how to assemble this source file MDISK.ASM. (This is a good learning experience and review for all readers. It will also show how a Batch file can be used for such a job. I know that I will still have to explain Batch files for many of the readers in a future article but I will give the readers what is needed to complete this work.)

First, put the following files on a newly formatted bootable disk. I know that all of the readers know how to do this using the commands - FORMAT/S and COPY:

```
1--MDISK.ASM-PROGRAMMER'S PACKAGE DISTRIBUTION DSK
2--MASM.EXE-PROGRAMMER'S PACKAGE DISTRIBUTION DSK
3--LINK.EXE-MS-DOS DISTRIBUTION DISK
4--EXE2BIN.EXE-MS-DOS DISTRIBUTION DISK
5--PARMS.ASM-PROGRAMMER'S PACKAGE DISTRIBUTION DSK
6--DEFMS.ASM-PROGRAMMER'S PACKAGE DISTRIBUTION DSK
7--DEFASCII.ASM-PROGRAMMER'S PACKAGE DISTR. DISK
8--MACLIB.ASM-PROGRAMMER'S PACKAGE DISTR. DISK
9--DEFDEV.ASM-PROGRAMMER'S PACKAGE DISTR. DISK
```

Both the H/Z-100 and H/Z-100-PC users will use the same files and the following Batch file. To make the assembly of the new disk driver as easy as pie (for beginners), I have chosen to use a Batch file. The readers can prepare this Batch file using the same procedure that I have described to create the CONFIG.SYS file. (Use COPY CON: MDISK.BAT and Return and then each of the following, one command on a line. Complete the file by pressing the F6 function key (H/Z-100-PC user) or entering CTRL-Z (H/Z-100 users). Otherwise, the reader can use the favorite Editor to prepare the file I called MDISK.BAT. Remember, with either method I suggest that the file be named MDISK.BAT:

```
ERASE MDISK.DVD
MASM MDISK
LINK MDISK
EXE2BIN MDISK MDISK.DVD
ERASE MDISK.OBJ
ERASE MDISK.EXE
```

NEXT, assemble the new disk driver file, MDISK.DVD, by entering MDISK and Return at the drive prompt. The Batch file will RUN all the necessary steps to do the required processing. When the Batch file has completed its steps, the reader should enter DIR to get a new directory of this disk and the file - MDISK.DVD - should now be found.

NOW, using the COPY command transfer this file to the disk that will contain the CONFIG.SYS file. Be sure that this CONFIG.SYS file has the command - DEVICES = MDISK.DVD SIZE = xxx--specified.

Reboot the system and the MDISK xxx should be available. Try the COPY command to put a file on the new memory disk. Request a DIR to see if the file is on memory disk. Did you find it?

I am not going to explain what the Batch file did to assemble this MDISK.DVD file at this time. I will explain in detail about such procedures when we discuss the MASM.EXE program in a future article. A little explanation would not be very helpful at this time for the beginners and the advanced readers will understand it without an explanation.

Other points of interest. The new MDISK.DVD file can be assigned a pathname PROVIDED it is being used with the CONFIG.SYS file. (Again, I realize that I have not ex-

Continued on page 109

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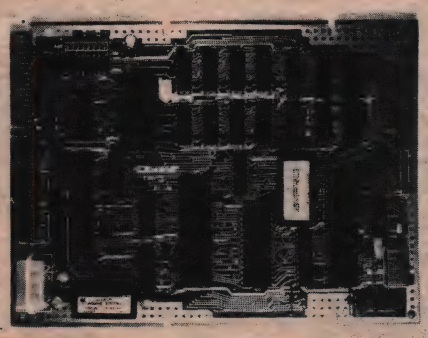

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How Well III
Continued from page 108

plained PATHS, but all in good time, I will have these all covered. I ask the readers that do not understand these items to bear with me until I can work them into articles.) Also, the user should remember that MDISK.DVD is a RAMdisk block device driver! If the reader is using the H/Z-100, the memory disk will become drive I, if the user has less than nine drives/partitions. If the user has the H/Z-100-PC, the memory disk will become the next consectively labelled drive letter. Finally, I will repeat that a second - DEVICE = MDISK.DVD SIZE = xxx - can be specified in the CONFIG.SYS file to provide two memory disks if there is enough RAM and the application warrants the two disks.

In addition to MDISK, there are at least two other memory disks of the same type on the PC Public Domain Library available on many Bulletin Boards for free:

1 - RAMDISK.SYS
2 - MEMBRAIN.EXE

RAMDISK.SYS can be used exactly like I have explained above for MDISK.DVD (it will not require you to assemble it). This memory disk is added to the CONFIG.SYS file with the following command line:

DEVICE = RAM

where nnn is a decimal number specifying the size of the memory disk in K bytes. The drive number will be defined as explained above.

MEMBRAIN is a similar device driver with a few extra features of doubtful value in my mind. Besides the ability of having the size and pathname being defined as explained above, it provides for the user to define the sector size (default is 512 bytes) and cluster size (default is one sector). The reader may find some use that I have not found, so be sure to try it if it is available.

The second type of memory disk is loaded into the computer at the DOS prompt the same way as any other user program. Here is an example:

RAMdrive D/X = nnn

where D is the letter identity of the drive to be simulated in RAM, "/" is a switch "X = nnn" can have more than one meaning depending on the particular program being used. One example - /U = xxx would reserve a minimum of xxx bytes of memory for the application program and its work space. This amount of memory will NOT be available for a memory disk. Another example - /M = xxx would reserve xxx bytes of memory for memory disk and this memory would not be available for the application program and its work space.

These program type RAMdisk software are widely available from at least 20 sources with some in Public Domain Libraries. This type of memory disk is available for the H8 and the H/Z-89 computers as well as the H/Z-100 and H/Z-100-PC computers. It should go without saying that the IBM-PC/XT and its Clones can use them as well! Nearly every third party memory expansion board vendor supplies one of the two types with their multifunction boards. The number of options that these various programs come with varies with the suppliers. All will be useful for the purpose that we are discussing.

Some of these programs allow the user to assign the REMdisk's drive designator while others automatically name the drive as the next available drive letter. Some programs require that the computer system configuration switches be set to indicate the additional RAMdrives, while others allow the user to assign the RAMdrive to only specific drive letter(s). There are some programs that allow the assignment of a drive letter that has already been assigned to an existing physical drive, enabling the user to use a RAMdrive with those applications that can write to only a specified letter drive.

Some of these RAMdrive programs will only create a RAMdisk of fixed size (64K, 160K, 360K, etc.), but the popular ones allow the user to specify the size of the memory disk based on the amount of memory that must be reserved for the application and its working space after the drive has been installed! There are many other available options with some of the software, BUT be SURE that the program's DOCUMENTATION is prepared so that when read by the user, the user will be able to use the program. That

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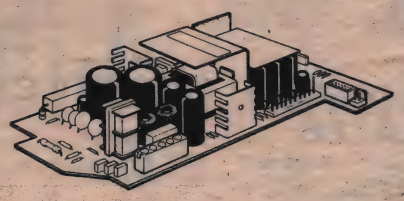

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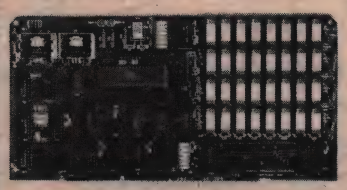

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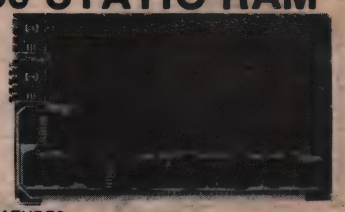

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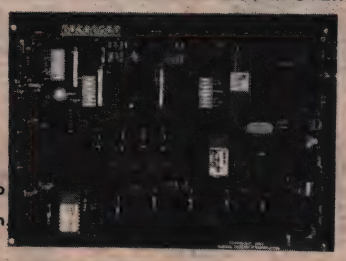

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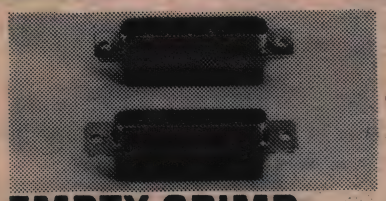
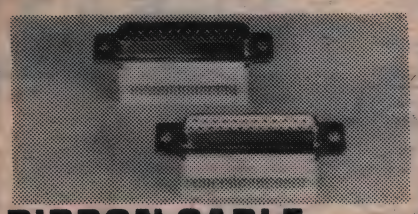
D-SERIES CONNECTORS



EMPTY CRIMP SHELLS

PART #	1-49	50-99	100-UP
	PRICE/QTY		
C9P	0.86	0.78	0.72
C9S	0.90	0.82	0.75
C15P	0.88	0.80	0.73
C15S	0.92	0.84	0.77
C25P	0.90	0.82	0.75
C25S	0.94	0.85	0.78
C37P	1.04	0.95	0.87
C37S	1.06	0.96	0.88
C50P	1.14	1.04	0.95
C50S	1.20	1.09	1.00



RIBBON CABLE CRIMP ON D CONNECTORS

PART #	1-49	50-99	100-UP
	PRICE/QTY		
IDC-9P	4.00	3.64	3.33
IDC-9S	4.28	3.89	3.57
IDC-15P	4.86	4.42	4.05
IDC-15S	5.24	4.76	4.37
IDC-25P	5.24	4.76	4.37
IDC-25S	5.82	5.29	4.85
IDC-37P	8.22	7.47	6.85
IDC-37S	8.92	8.11	7.43
IDC-50P	19.71	18.40	17.25
IDC-50S	23.87	20.46	19.09

GRAY HOODS

PART #	1-49	50-99	100-UP
	PRICE/QTY		
GH-9	1.02	0.93	0.85
GH-15	1.04	0.95	0.87
GH-25	.95	0.80	0.66
GH-37	1.18	1.07	0.98
GH-50	1.32	1.20	1.10

CONTACTS FOR EMPTY CRIMP SHELLS

PART #	1-99	100-999	1000-UP
	PRICE/QTY		
CP20P	0.08	0.07	0.06
CP20S	0.10	0.09	0.08

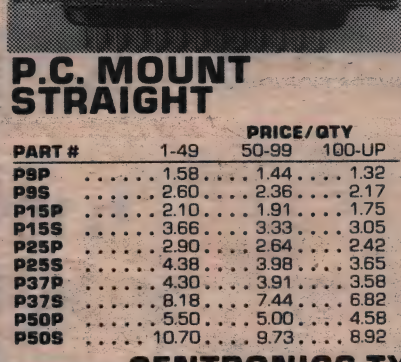
RS—232 DB—25 WALL PLATES

metal wall plates

PART #	1-24	25-49	50-UP
	PRICE/QTY		
WP-1	2.95	2.66	2.36
WP-2	3.45	3.11	2.76

P.C. MOUNT STRAIGHT

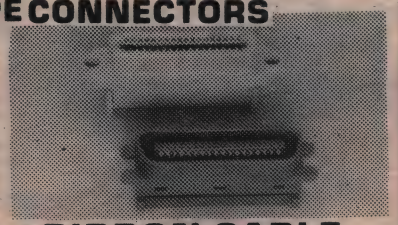
PART #	1-49	50-99	100-UP
	PRICE/QTY		
P9P	1.58	1.44	1.32
P9S	2.60	2.36	2.17
P15P	2.10	1.91	1.75
P15S	3.66	3.33	3.05
P25P	2.90	2.64	2.42
P25S	4.38	3.98	3.65
P37P	4.30	3.91	3.58
P37S	8.18	7.44	6.82
P50P	5.50	5.00	4.58
P50S	10.70	9.73	8.92



CENTRONICS TYPE CONNECTORS

SOLDER POT TYPE

PART #	1-49	50-99	100-UP
	PRICE/QTY		
CEN-36P	4.00	3.64	3.33
CEN-36S	4.20	3.82	3.50
CEN-36SCM	3.50	3.18	2.92



RIBBON CABLE CRIMP ON

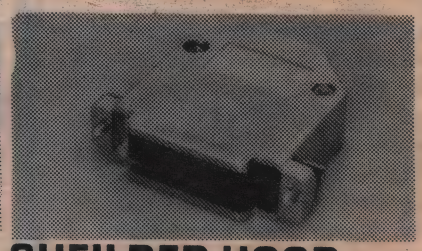
PART #	1-49	50-99	100-UP
	PRICE/QTY		
IDC-36P	6.00	5.45	5.00
IDC-36S	7.90	7.18	6.58

RS—232 GENDER CHANGERS

PART #	1-9	10-UP
	PRICE/QTY	
AGC-M	9.95	7.95
AGC-F	9.95	7.95

P.C. MOUNT RIGHT ANGLE

PART #	1-49	50-99	100-UP
	PRICE/QTY		
R9P	2.54	2.31	2.12
R9S	2.60	2.36	2.17
R15P	2.98	2.71	2.48
R15S	3.10	2.82	2.58
R25P	3.72	3.38	3.10
R25S	3.00	2.73	2.50
R37P	4.70	4.27	3.92
R37S	4.90	4.45	4.08
R50P	9.72	8.84	8.10
R50S	11.00	10.00	9.17



SHEILDED HOOD

PART #	1-49	50-99	100-UP
	PRICE/QTY		
SH-25	1.35	1.23	1.13

CRIMPING TOOL

for crimping D series contacts

PART #	PRICE/QTY PRICE
CT-1645	79.95 EACH

CONTACT EXTRACTOR TOOL

extracts contacts from D crimp shells

PART #	PRICE/QTY PRICE
EX-1	2.75 EACH

D-SERIES HARDWARE

PART #	1-49	50-99	100-UP
	PRICE/QTY		
MDH-1	0.55	0.45	0.35
FDH-1	0.85	0.75	0.65

SOLDER POT TYPE

PART #	1-49	50-99	100-UP
	PRICE/QTY		
9P	1.44	1.31	1.20
9S	1.94	1.76	1.62
15P	1.96	1.78	1.63
15S	2.60	2.36	2.17
DB-25P	1.85	1.60	1.45
DB-25S	2.10	1.85	1.65
37P	4.00	3.64	3.33
37S	5.20	4.73	4.33
50P	5.08	4.62	4.23
50S	7.80	7.09	6.50

BLACK AMP HOODS

PART #	1-49	50-99	100-UP
	PRICE/QTY		
AH—25	1.30	1.18	1.08

RIBBON CABLE CONNECTORS

IDH SHROUDED HEADERS

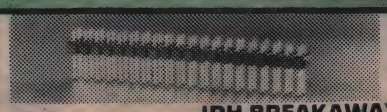
P.C. MOUNT RIGHT ANGLE

PART #	1-49	50-99	100-UP
	PRICE/QTY		
IDH-10R	0.80	0.72	0.64
IDH-20R	1.20	1.08	0.96
IDH-26R	1.50	1.35	1.20
IDH-34R	2.00	1.80	1.60
IDH-40R	2.40	2.16	1.92
IDH-50R	2.95	2.66	2.36
IDH-60R	3.86	3.47	3.09

P.C. MOUNT STRAIGHT

PART #	1-49	50-99	100-UP
	PRICE/QTY		
IDH-10	0.80	0.72	0.64
IDH-20	1.15	1.04	0.92
IDH-26	1.50	1.35	1.20
IDH-34	1.95	1.76	1.56
IDH-40	2.30	2.07	1.84
IDH-50	2.85	2.57	2.28
IDH-60	3.45	3.11	2.76

.1 x .1 spacing, gold plated pins



IDH BREAKAWAY HEADER STRIPS

P.C. MOUNT STRAIGHT

PART #	1-49	50-99	100-UP
	PRICE/QTY		
IDH-10B	0.30	0.27	0.25
IDH-14B	0.42	0.38	0.35
IDH-16B	0.48	0.44	0.40
IDH-20B	0.60	0.55	0.50
IDH-26B	0.78	0.71	0.65
IDH-34B	1.02	0.93	0.85
IDH-40B	1.20	1.09	1.00
IDH-50B	1.50	1.36	1.25
IDH-60B	1.80	1.64	1.50
IDH-80B	2.40	2.18	2.00

P.C. MOUNT RIGHT ANGLE

PART #	1-49	50-99	100-UP
	PRICE/QTY		
IDH-10BR	0.38	0.35	0.32
IDH-14BR	0.53	0.48	0.44
IDH-16BR	0.61	0.55	0.51
IDH-20BR	0.76	0.69	0.63
IDH-26BR	0.99	0.90	0.82
IDH-34BR	1.29	1.17	1.08
IDH-40BR	1.52	1.38	1.27
IDH-50BR	1.90	1.73	1.58
IDH-60BR	2.28	2.07	1.90
IDH-80BR	3.04	2.76	2.53

dual row .1 x .1 spacing, gold plated pins

ALTEX ELECTRONICS

RIBBON CABLE CRIMP ON CONNECTORS

IDS SOCKET TYPE

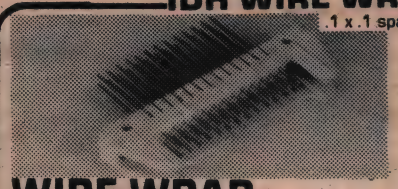
PART #	PRICE/QTY 1-49	50-99	100-UP
IDS-10	1.15	1.04	0.92
IDS-14	1.35	1.22	1.08
IDS-16	1.45	1.31	1.16
IDS-20	1.50	1.35	1.20
IDS-26	2.40	2.16	1.92
IDS-34	2.90	2.61	2.32
IDS-40	3.50	3.15	2.80
IDS-50	4.25	3.83	3.40
IDS-60	5.80	5.22	4.64

IDE EDGE CARD TYPE

PART #	PRICE/QTY 1-49	50-99	100-UP
IDE-10	1.90	1.71	1.52
IDE-14	2.00	1.80	1.60
IDE-20	2.25	2.03	1.80
IDE-26	2.65	2.39	2.12
IDE-34	2.95	2.66	2.36
IDE-40	3.50	3.15	2.80
IDE-50	4.25	3.83	3.40

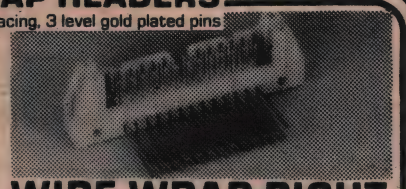
IDH WIRE WRAP HEADERS

.1 x .1 spacing, 3 level gold plated pins



WIRE WRAP STRAIGHT

PART #	PRICE/QTY 1-49	50-99	100-UP
IDH-10W	1.50	1.35	1.20
IDH-20W	2.55	2.30	2.04
IDH-26W	3.20	2.88	2.56
IDH-34W	3.75	3.38	3.00
IDH-40W	4.50	4.05	3.60
IDH-50W	5.50	4.95	4.40



WIRE WRAP RIGHT ANGLE

PART #	PRICE/QTY 1-49	50-99	100-UP
IDH-10WR	2.45	2.21	1.96
IDH-20WR	2.60	2.34	2.08
IDH-26WR	3.25	2.93	2.60
IDH-34WR	3.80	3.42	3.04
IDH-40WR	4.65	4.19	3.72
IDH-50WR	5.55	5.00	4.44

IDP PLUG CONNECTOR

mates with IDS type connectors

PART #	PRICE/QTY 1-49	50-99	100-UP
IDP-20P	3.95	3.16	2.53
IDP-34P	4.95	3.96	3.17
IDP-50P	5.95	4.76	3.81

IDD DIP PLUG CONNECTOR

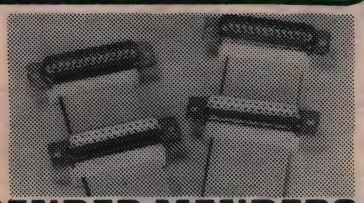
for pluging into IC sockets

PART #	PRICE/QTY 1-49	50-99	100-UP
IDD-14	1.30	1.17	1.05
IDD-16	1.65	1.49	1.34
IDD-24	2.25	2.03	1.82
IDD-40	3.90	3.51	3.16

RIBBON CABLE ASSEMBLYS

D-SERIES RIBBON CABLES

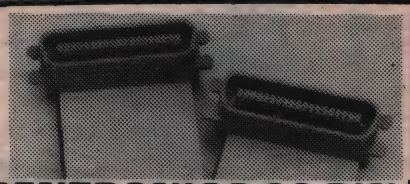
PART #	PRICE
9P-9P	8.00 + .18 per foot
9P-9S	8.28 + .18 per foot
9S-9S	8.56 + .18 per foot
15P-15P	9.72 + .30 per foot
15P-15S	10.10 + .30 per foot
15S-15S	10.48 + .30 per foot
25P-25P	10.50 + .50 per foot
25P-25S	11.10 + .50 per foot
25S-25S	11.30 + .50 per foot
37P-37P	16.44 + .74 per foot
37P-37S	16.95 + .74 per foot
37S-37S	17.80 + .74 per foot



GENDER MENDERS

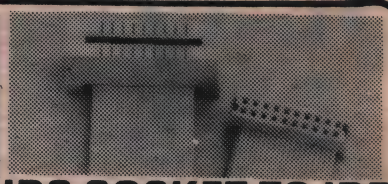
PART # GM—25	PRICE
GM-25	22.50 + .50 per foot

25 pin RS-232 cable with a male and female connector on each end.



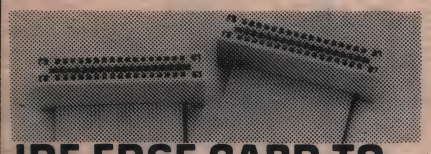
CENTRONICS 36 PIN RIBBON CABLES

PART #	PRICE
36P-36P	12.00 + .72 per foot
36P-36S	13.45 + .72 per foot
36S-36S	15.90 + .72 per foot



IDS SOCKET TO IDE EDGE CARD RIBBON CABLES

PART #	PRICE
10S-10E	3.05 + .20 per foot
14S-14E	3.35 + .28 per foot
20S-20E	3.75 + .40 per foot
26S-26E	5.05 + .52 per foot
34S-34E	5.85 + .68 per foot
40S-40E	7.00 + .80 per foot
50S-50E	8.50 + 1.00 per foot

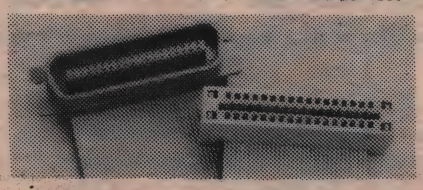


IDE EDGE CARD TO IDE EDGE CARD RIBBON CABLES

PART #	PRICE
10E-10E	3.80 + .20 per foot
14E-14E	4.00 + .28 per foot
20E-20E	4.50 + .40 per foot
26E-26E	5.30 + .52 per foot
34E-34E	5.90 + .68 per foot
40E-40E	7.00 + .80 per foot
50E-50E	8.50 + 1.00 per foot

CENTRONICS TO IDS-40 RIBBON CABLES

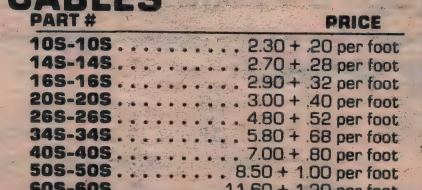
PART #	PRICE
36P-40S	9.50 + .72 per foot



CENTRONICS TO IDE-34 RIBBON CABLES

printer cable for TRS-80 computers

PART #	PRICE
36P-34E	10.25 + .68 per foot



IDS SOCKET TO IDS SOCKET RIBBON CABLES

PART #	PRICE
10S-10S	2.30 + .20 per foot
14S-14S	2.70 + .28 per foot
16S-16S	2.90 + .32 per foot
20S-20S	3.00 + .40 per foot
26S-26S	4.80 + .52 per foot
34S-34S	5.80 + .68 per foot
40S-40S	7.00 + .80 per foot
50S-50S	8.50 + 1.00 per foot
60S-60S	11.60 + 1.20 per foot

IDD DIP PLUG TO IDD DIP PLUG RIBBON CABLES

PART #	PRICE
14D-14D	2.60 + .28 per foot
16D-16D	3.30 + .32 per foot
24D-24D	4.40 + .48 per foot
40D-40D	7.80 + .80 per foot

PARALLEL PRINTER CABLES

IBM PC TO PARALLEL PRINTER

PART #	PRICE	10-UP
PPC-301-5	19.95	16.95
PPC-301-10	24.95	19.95

SERIAL/PARALLEL DATA TRANSFER SWITCHES

PART #	DESCRIPTION	PRICE
AB-25	RS-232 SWITCHBOX	88.00

switches all 25 lines; two positions for interfacing; two printers to one computer or one printer to two computers

PART #	DESCRIPTION	PRICE
AB-36	PARALLEL SWITCHBOX	138.00

switches all 36 lines two positions for interfacing two computers to one printer or two printers to one computer.

PART #	DESCRIPTION	PRICE
AB-5	RS-232 5 PORT SWITCHBOX	149.95

switches 12 lines 5 positions for connecting any one of five terminals to one serial modem or five parallel printers to one computer or vice versa.

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How Well III
Continued from page 109

may seem far-fetched, but I have read some documentation that left me knowing less than before I looked or read the documentation! Be sure to check that the program will have the options that your application will require.

I would also suggest that this DOS program type of RAMdrive be loaded automatically with all its options specified using the AUTOEXEC.BAT file. I know that if you want to vary the options for several applications that this is not very feasible, but when we discuss these batch files maybe we will find a way around this problem. In the meantime maybe some of the advanced users would like to come up with ideas of how this could be done. LET me know about your ideas and I will include them with mine to help the other Heath/Zenith users!

RAMdrives are known by many glamorous names - emulated disks, memory disks, electronic disks, pseudodisks, hyperdisks, etc. I have also seen them called "logical disks" and "virtual disks". These terms have other meanings in computer jargon, so I dislike their use for RAMdrive names.

Because either type of RAMdrive have no moving parts, they perform disk operations (I/O processing) nearly 50 times faster than floppy disk drives and at least 10 times faster than hard disk drives. In addition to providing greater through-put, a RAMdrive will prolong the life of both the disks and the disk drives! These advantages are nearly FREE in the form of DOLLARS, but their advantages are NOT free in terms of usage. Let me explain! The RAMdrive stores its data in electronic memory (RAM), and any files that should be saved for later use MUST be copied onto physical (floppy or hard) disks. If the computer should become inoperative due to a system error or a power interruption before the file is SAVED, the contents of the RAMdisk are LOST!!!

There are some measures of insurance that can be taken, BUT no really complete answer! The user can equip the computer with a battery-operated backup power source that must be chosen carefully so that it will "kick-in" fast enough to prevent the computer from re-setting itself. These are expensive! A lower priced "fix" is to add a large capacitor to the computer power supply DC output so that short interruptions will NOT cause a loss of the RAM contents. I am presently experimenting with this idea and I will report to the readers when I have something worth while. Has any reader tried such things? Please let me know your results so that I can report them to the readers!

Another choice is to use only copies of programs, not data files, on the RAMdisk. This defeats the purpose in many applications where the data is manipulated. To maximize the through-put, programs that have "disk-intensive" data base management files, for example, require a memory disk the most. Again, the use of a "macro processor" requires that the user define the steps necessary to copy the RAMdisk files with a single keystroke or key combination that will copy the data files in the RAMdisk to a physical disk drive might be a partial answer. This approach can NOT anticipate or recover data lost because of a power problem, BUT it could make SAVING the RAMdisk data files so easy that it becomes second nature.

RAMdisks do not use or permit the use of the FORMAT command. The DIR and CHKDSK commands will perform with memory disks. Once a RAMdisk is loaded, it is ready for use. RAMdrives can facilitate the use of subdirectories with applications that do not recognize subdirectory paths (older user programs). Remember that a RAMdisk will NOT increase through-put where the applications does not require access to disk files during execution (some spreadsheet programs). RAMdisks will make the greatest improvement in through-put with applications that require frequent read/write processing to program or data disk files.

I have about run out of space in **Computer Shopper** for this article and I have just discussed two possible ways to increase "through-put" of the computer! My experience has shown me that with most computers the problem is one of being I/O processing "bound"

Continued on page 113

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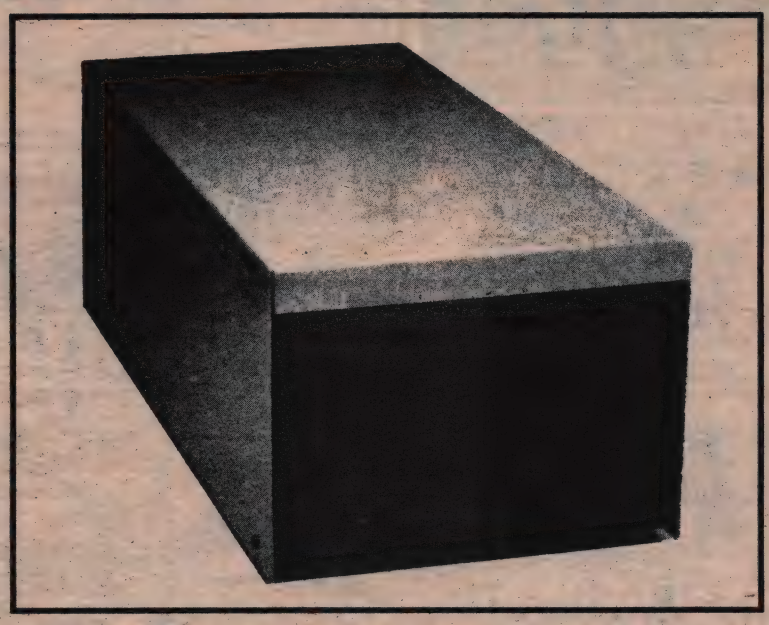

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Ask The Guru
Continued from page 106

and subtract $40 so it becomes $00-1F instead. The tearing method in my Enhance I (SAMS #21822) makes this super easy.

You can also write the people who sold you the software, but chances are they will try to sell you an upgrade, rather than give you a free patch.

There are other, more subtle reasons why some oddball older programs may not work with the IIe upgrade, even when using the old character generator. While these programs are in the minority, they may only work if you swap all four chips back the way they were.

For instance, some programs use "illegal" monitor entry points. Many of these locations have been moved somewhere else in the new monitor ROMs. Some wacky protection schemes used a bug in the old 6502 jump indirect command as a silly attempt to confuse any Apply user under six years old. No bug, no access. Interrupts can now cause royal foulups in programs that neither expect nor allow them. Certain oddball 65C02 instructions have different timing

Continued on page 114

How Well III
Continued from page 112

with applications. Therefore, changing the clock speed of the CPU will not make nearly as big improvement in throughput as what is capable with finding the optimum disk buffer and RAMdrive size. So, this month I have covered the area that should be searched first for the optimum trade off with the smallest expenditure of dollars and time!

In summary, although the BUFFERS size and RAMdisk will greatly increase the through-put for many applications, the increase is not constant for all applications. Again, refer to the definition of "through-put" at the beginning of this article! ●

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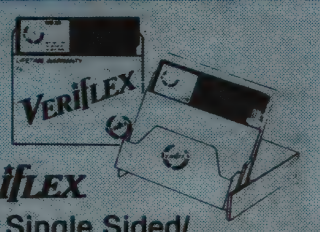
```
Program one -- This SNATCHMON Applesloth routine will capture
               your Apple IIe monitor ROMs so they can be
               sent to an EPROM burner for cloning.

 10  REM
 18  REM ************************
 20  REM *                      *
 22  REM *     "SNATCHMON"      *
 24  REM * IIE MONITOR GRABBER  *
 26  REM *  FOR EPROM BURNERS   *
 28  REM *                      *
 30  REM *     VERSION 1.0      *
 32  REM *.....................*
 34  REM *                      *
 36  REM *  COPYRIGHT 1984 BY   *
 38  REM *  DON LANCASTER AND   *
 40  REM *  SYNERGETICS,  BOX   *
 42  REM *  1300 THATCHER AZ.   *
 44  REM * 85552. 602-428-4073 *
 46  REM *                      *
 48  REM *   ALL  COMMERCIAL    *
 50  REM *   RIGHTS RESERVED    *
 52  REM *                      *
 54  REM ************************

 80  REM  THIS PROGRAM "CAPTURES"
 82  REM  THE APPLE IIE MONITOR
 84  REM  INTO FOUR 4K WORKFILES
 86  REM  FOR USE WITH AN EPROM
 88  REM  BURNER WHOSE WORK FILES
 90  REM  BEGIN AT HEX $8000.
 99  REM
          ..................

100  TEXT : HOME : CLEAR : GOSUB 2000: REM  GET TUTORIAL
110  VTAB 12: HTAB 7: PRINT "MONITOR SNATCH IN PROGRESS"
120  PRINT : FLASH : HTAB 14: PRINT "PLEASE WAIT": NORMAL
199  REM
          ..................

200  REM : $C100-CFFF GRAB

210  POKE 32763,160: POKE 32764,00: POKE 32765,76:
      POKE 32766,44: POKE 32767,254: REM CLEAR Y REGISTER
      BEFORE MOVE!

220  POKE 32768,0: POKE 60,00: POKE 61,128: POKE 62,254:
      POKE 63,128: POKE 66,01: POKE 67,128: CALL 32763:
      REM  ZERO $8000-$80FF

230  POKE 49159,0: POKE 49163,0:
      REM READ INTERNAL C3 AND CX ROM

240  POKE 60,00: POKE 61,193: POKE 62,255: POKE 63,207:
      POKE 66,00: POKE 67,129: CALL 32763:
      REM  MOVE $C100-$CFFF

250  POKE 49158,0: POKE 49162,0:
      REM READ USUAL C3 AND CX SLOTS

260  PRINT : PRINT "[D]BSAVE IIEMON.C,A$8000,L$1000
270  REM : SAVE $C100-$CFFF TO DISK

299  REM
          ..................

300  REM : $D000-DFFF GRAB
310  POKE 60,00: POKE 61,208: POKE 62,255:
      POKE 63,223: POKE 66,00: POKE 67,128:
      CALL 32763: REM  MOVE $D000-$DFFF

320  PRINT : PRINT "[D]BSAVE IIEMON.D,A$8000,L$1000
399  REM
          ..................

400  REM : $E000-EFFF GRAB

410  POKE 60,00: POKE 61,224: POKE 62,255:
      POKE 63,239: POKE 66,00: POKE 67,128: CALL 32763:
      REM      MOVE $D000-$DFFF

420  PRINT : PRINT "[D]BSAVE IIEMON.E,A$8000,L$1000
499  REM
          ..................

500  REM : $F000-FFFF GRAB

510  POKE 60,00: POKE 61,240: POKE 62,255:
      POKE 63,255: POKE 66,00: POKE 67,128:
      CALL 32763: REM  MOVE $F000-$FFFF

520  PRINT : PRINT "[D]BSAVE IIEMON.F,A$8000,L$1000
599  REM
          ..................

600  TEXT : HOME : CLEAR
610  FOR N = 1 TO 30:ZZ =  PEEK (49200) +  PEEK (49200) +
      PEEK (49200): NEXT N: REM BRACK

900  PRINT "MONITOR SNATCH COMPLETE" : PRINT : END
910  REM
          ..................

2000  REM : TUROTIAL AND PROMPT

2008  POKE 49167,0: REM  ALTSET ON
2010  VTAB 1: HTAB 12: FOR NN = 1 TO 15: PRINT  CHR$ (127);:
       NEXT NN: PRINT
2012  HTAB 12: PRINT  CHR$ (127);"  SNATCHMON  "; CHR$ (127)
2014  HTAB 12: FOR NN = 1 TO 15: PRINT  CHR$ (127);: NEXT NN:
       PRINT
2015  PRINT : PRINT
2016  PRINT "This program 'captures' the Apple IIe's monitor
       ROM into four 4Kx8 binary files named IIEROM.C thru
       IIEROM.F": PRINT
2017  POKE 1677,162: POKE 1686,162:
       REM  REAL QUOTES WITHOUT TEARS
2018  PRINT "Default use address is $8000, as needed by the
       MPC ap-ep EPROM burner.": PRINT : PRINT
2020  PRINT "Please insert SAVE disk into Drive 1.": PRINT :
       PRINT : PRINT "Then press  < space > to CONTINUE": PRINT
2022  HTAB 15: PRINT "-or-": PRINT
2024  HTAB 13: PRINT "< escape> to ABORT": PRINT : PRINT
2026  HTAB 13: PRINT "---< >---"; CHR$ (08); CHR$ (08);
       CHR$ (08); CHR$ (08); CHR$ (08);
2028  GET Z$
2030  IF Z$ >  < " " THEN  TEXT : HOME : CLEAR : END
2040  TEXT : HOME
2050  POKE 49166,0: REM  PRIMARY CHARACTER SET
2100  RETURN

Gotchas:  [D] means <control-D>.

                < end absrst program one >
```

LOOK AT THESE PRICES!

BOXED DISKETTES



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Verbatim		
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Ask The Guru
Continued from page 113

than they would on a 6502. This can ruin extremely time-critical code, such as might be used for disk access, a so called "copy protection" scheme, or as an exact video screen lock.

So, by all means make the IIe upgrade. But, be sure to backup all firmware first, and expect to have compatibility problems with most, if not all, of your favorite software. Chances are the double character generator adaptor will solve the worst of your compatibility hassles.

How Can I Start ET Watching?

The proper name of this activity is called SETI, short for Search for Extra-Terrestial Intelligence.

Surprisingly, there are a large number of amateur radio astronomers that are doing lots of very interesting, very impressive, and very legitimate research these days. All this on their own, without grants or federal help. Their trip, rather than someone elses.

I feel that an extra-terrestial contact is possibly imminent.

Why do I feel this way? Three main reasons. First, our sun suddenly and dramatically became a radio star in the early 1950's, thanks to Uncle Milty, Captain Video, and the Roller Derby. Kukla, Fran, and Ollie are now our good will ambassadors to those "out there", and they have now traveled 35 light years from us. This distance is now great enough to attract attention in many candidate star systems.

And, yes, we could detect them sending the same radio energy levels back to us with what we have today in the way of receiver and computer technology.

Secondly, if we were being droid-watched, all the previous messages sent back would probably have said "No problem" for the past several million years. Current messages would instead suddenly be of the "Oh oh, we now got a problem" variety.

And thirdly, we have much more powerful listening tools available to dedicated individuals on a sane budget than we ever did before. And, my oh my, do we now have computers.

As personal and convival tools. And as mind amplifiers.

Anyway, the center of amateur SETI activities seems to be a group called the **Society of Amateur Radio Astronomers**, which is headed by one Jeffrey M. Lichtman.

Jeffrey has self-published several very interesting and very useful books. One is **Microwave Radio Astronomy, An Amateur Introduction.** A second is **Solar Amateur Radio Astronomy**, and a final nuts-and-bolts one is the **Amateur Radio Astronomers Circuit Cookbook.** Cost is around $35 total for all three.

It's interesting to note the similiarity between many radio astronomy circuits and those things that electronic hackers are already doing, such as legal access of satellite broadcasts, and not quite so legal piracy of MDS distribution systems. Much of the same circuitry can be adapted or used directly, and the larger market for the satellite stuff has driven the costs way down. Antenna mounts and tracking mechanisms, or course, scream robotics.

Another thing you can do is visit the free Visitor Center at the VLA radio astronomy very large array facility outside Magdalena, New Mexico. Visitors are most definitely welcome, but play down the ET watching if you expect to

Continued on page 116

```
Program two --

xx p
 pnd
 ppr[L]
 ppr            Don Lancaster's TRIPLE HEADER WPL Utility
 ppr ==========================================================
 ppr
 ppr This module will print a document with a three line single spaced
 ppr header, using print constants built into the WPL code itself.
 ppr
 ppr To continue, you must have the document to be printed inside your
 ppr Apple, and a disk having this program AND lots of space left must
 ppr be placed in the active drive.
 ppr
 pin                OK to continue (Y/N) -----------> =$A
 ppr
 pcs/Y/$A/
 pgoaa
 pcs/y/$A/
 pgoaa
 pqt
aa pin   Top Header -----> =$A
   pin   Middle Header --> =$B
   pin   Bottom Header --> =$C
 ppr
   pin   Left Margin ----> =$D
   psx$D
   pin   Right Margin ---> =$D
 psy$D
 psz$D
 psz-(x)
 p
 p  NOTE: (z) is RM-LM
 p
 ppr
 pin                OK to continue (Y/N) -----------> =$D
 pcs/Y/$D/
 pgobb
 pcs/y/$D/
 pgobb
 ppr[L]
 pgoxx
bb ppr
 ppr      *** busy formatting - may take several minutes ***
 p
 p    print third header to width RM-LM
 plm0
 prm(z)

 ppnl
 ptm4
 pbm4
 ppl58
 ppi63
 pli0
 psp0
 ppd8
 pcr0
 out\
 plj
 ptl$C
 pbl
 p
 pnp
 zzz
 y
 p
 p   print second header
 p
 ny
 p
 lzzz
 p
 b
 f<<.rm240><
 y?
 p
 pcr0
 ptm0
 pbm0
 ppm0
 plm0
 prm(z)
 ptl$B
 ppi64
 ppl64
 put
 pnp
 zzz
 y
 p
 p  print final with first header
 p
 ny
 lzzz
 p
 b
 f<<.rm240><
 y?
 p


 ppi66
 ppl65
 ppd1
 ptl$A
 pcr1
 plm(x)
 prm(y)
 put
 pnp
 p
 p   erase old scratch file
 p
 oe
 zzz
 p
 pyd
 pqt

Gotchas:  [L] means <control-L>.  To use, [P] DO TRIPLE.HDR.WPL

< end guru 4, program two >
```


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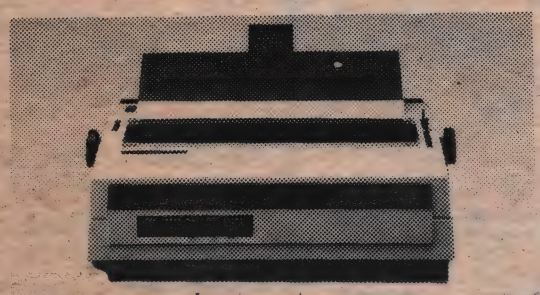

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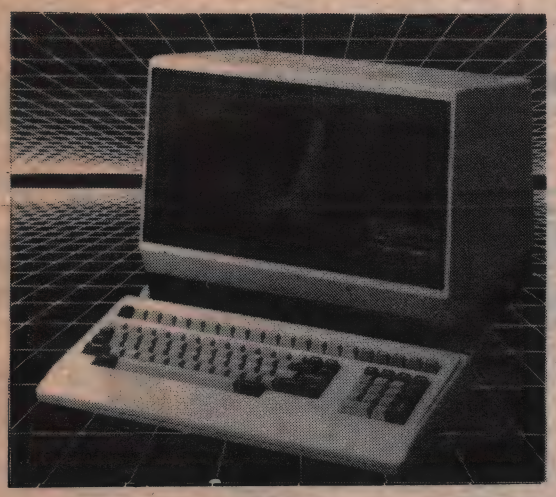

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Ask The Guru
Continued from page 114

get behind the scenes and be treated seriously.

Magdalena lies within the greater Datil-Pietown-Quemado metropolitan area. Take the outer loop expressway through the theater and industrial district. Then turn left at the fifth cow.

And, while you are in the neighborhood, drop in and help me quest a tinaja or two. The VLA is only half a day's drive away.

Is There a Replacement for SOFTALK?

Before their untimely demise, **Softalk** was far and away the "best" Apple magazine, when measured in terms of user interest, enthusiasm, commitment, and their no nonsense beginner to mid-level technical and programming information.

A much leaner and much more compact replacement for **Softalk** now exists, edited by Tom Weishaar, who was one of the better of **Softalk**'s contributing editors.

The magazine is called **Open-Apple**, and it is now up to its sixth issue.

By special arrangements, a free sample copy is available to any **Computer Shopper** subscriber, provided you use the secret password "tinaja" in your request.

Cost is $24 per year. There are no vaporware ads, no misleading ads, no bait and switch ads, no not-in-stock ads, no ads for overpriced products, and no pure puffery ads. In fact, as you might have guessed by now, there are no ads at

Continued on page 118

Lancaster, Guru 4, figure two

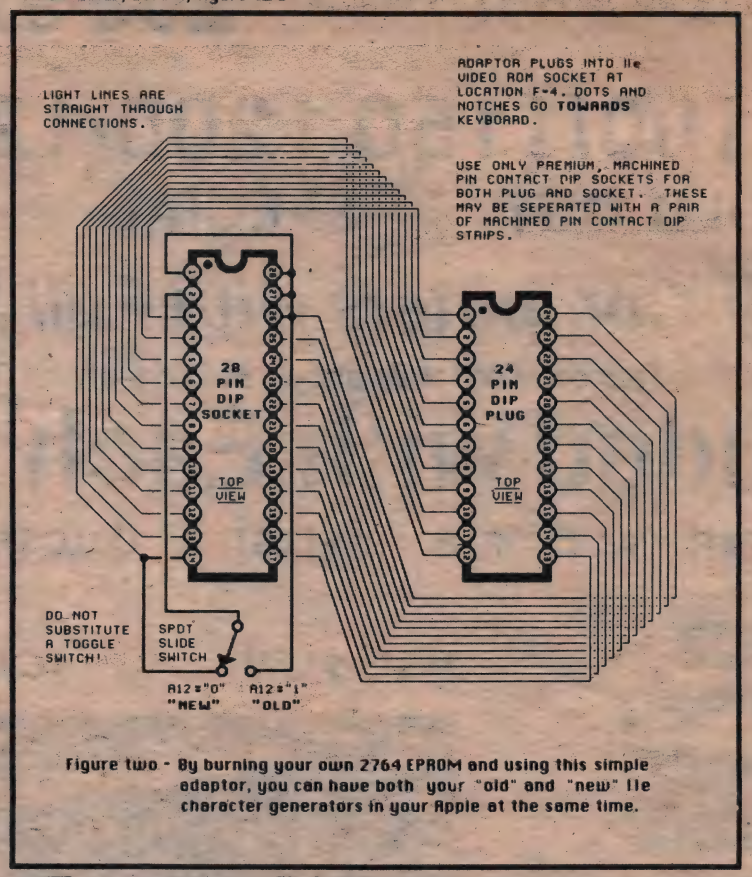
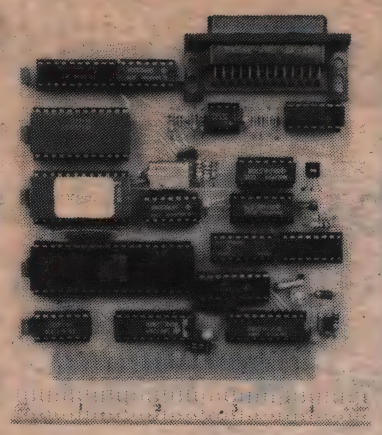


Figure two - By burning your own 2764 EPROM and using this simple adaptor, you can have both your "old" and "new" IIe character generators in your Apple at the same time.

MIRAC RS232



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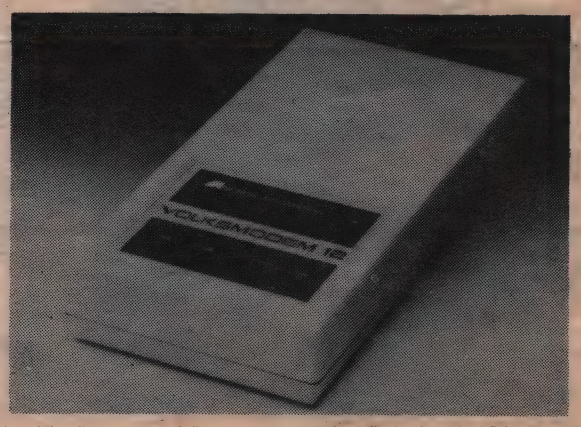

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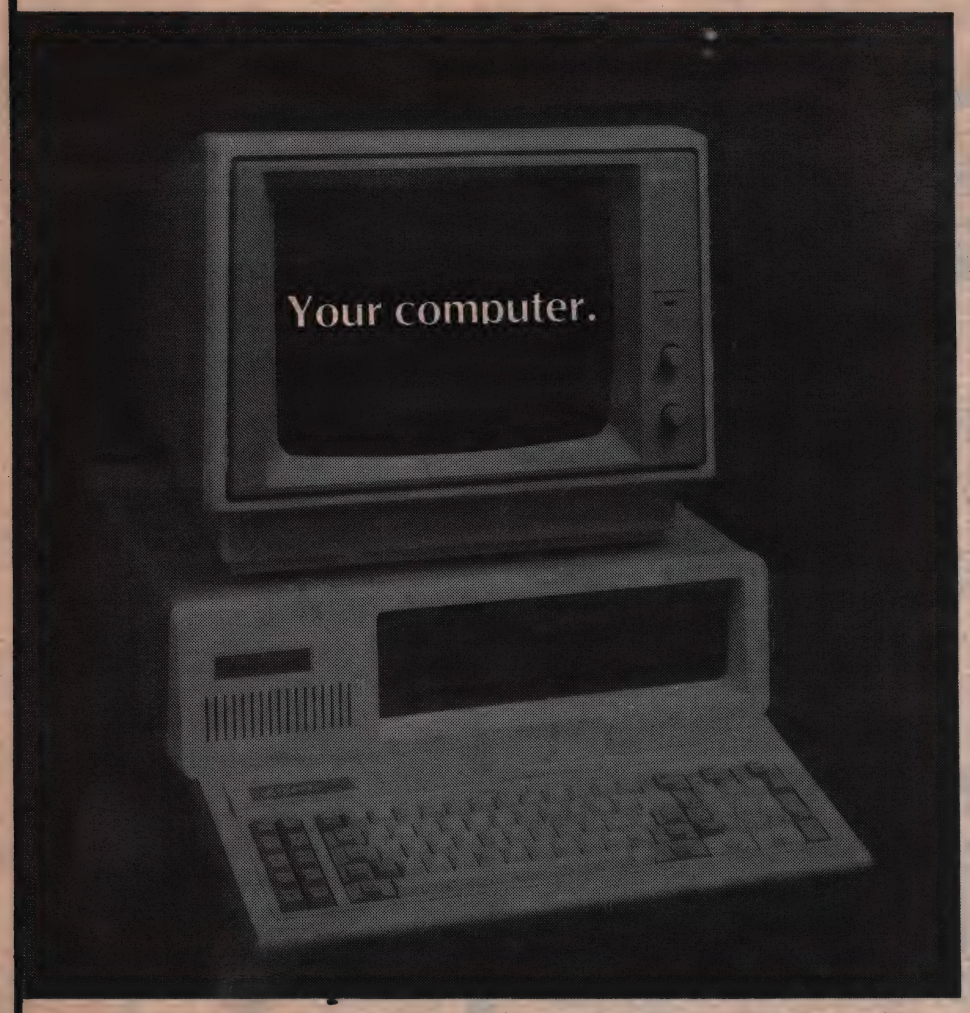

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Ask The Guru
Continued from page 116

all. Just beginner to mid-level Apple technical information in the most solid and concise form, just as you would expect from Tom.

Show Me an Applewriter Triple Header

I guess I was a little vague and sloppy last month on that Applewriter multi-column question. So, here in Program two is a WPL routine that will automatically handle a triple header of any combination of left, centered, and right entries, with or without page numbers in any position.

This particular version works best on ProDOS Applewriter 2.0 or 2.1. Changes may be needed for certain printer and card combinations, on other versions,, or to suppress the first page headers.

To use it, you put the file you want printed in your IIe or IIc. Then, you put a disk that has TRIPLE.HDR.WPL and lots of scratch space into the active drive. Finally, a DOTRIPLE.HDR.WPL will automatically prompt you for the header information and do all the nasty stuff invisibly and automatically.

When prompted, you enter each header line exactly the same way you would a TL or BL entry, using delimiters and a "#" to substitute for the page number.

Only minus the TL.

Since this WPL routine does the impossible, it takes its good old time about doing it. Up to several minutes may be needed to format and then print a longer textfile. All the sneaky stuff is handled by a magic trip or two through PD8 land.

Neat, huh?

If you get tricky enough, you can have single spaced headers and double spaced text, or vice versa. Any way you like.

By imbedding a TL command as a TL line (!), you can neatly handle even and odd page formats on successive pages.

You can extend the code to any number of header and footer lines. If you wanted to, you could even use a 33 line header and a 33 line footer, provided you don't have much to say in the body of your text.

As usual, I have bunches of Applewriter stuff on hand, some free, and some not so free. Some for beginners and some for gonzo hackers. Sixteen disk sides worth. Write or call for info.

Where do I get Information on Laser Printers?

Apple has a brand new $75 notebook called **Inside Laserwriter.** It includes a full and thorough discussion of **Postscript**, the brand-new, Forth-like typesetting language that puts this laser printer head and shoulders above its shoddy look-alike imitators.

Also included are driver and support software diskettes that let you link your own routines to control the printer.

Kiddies, it is now a whole new self-publishing ballgame. Back to square one.

Now for the neat part. The part the Mac people don't want you to hear. Guess which software package makes the best use of Postscript and the Laserwriter?

No, not MacPaint, because MacPaint has no way to use high resolution typography. All you get here is bitmaps, with no mechanism to handle the fancy, high quality fonts. And, there's no way to directly command Postscript.

No, not MacWrite, because MacWrite does not handle graphics well, nor large graphics at all. And once again, there's no way to directly command Postscript.

No, not MacDraw, first because MacDraw is far and away the most user-vicious of all Mac software besides its not existing at all in usable form. The inability to use bitmaps totally cripples MacDraw. Besides, every seven weeks, Apple very carefully takes MacDraw apart, and then removes all of the old bugs. Then Appple carefully puts lots of brand new bugs back in, so the next seven week cycle can continue. And there's still no

Continued on page 127

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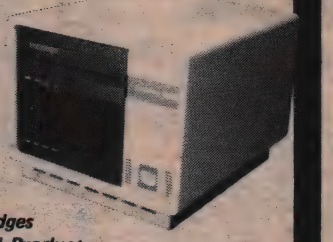
Solo 50MBy SASI System



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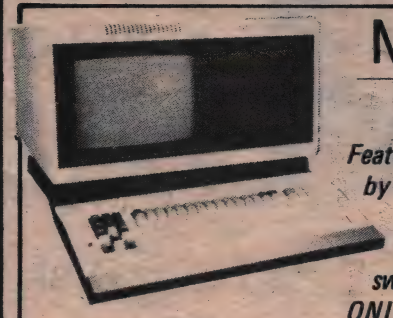

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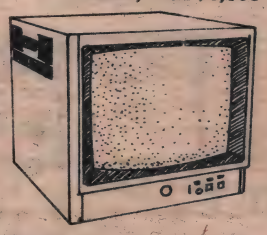

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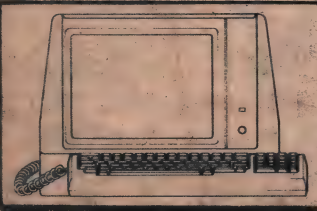

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HM6264LP-15	8192x8	(150ns)(cmos)(LP)	10.95
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LP=Low power Qstat=Quasi-Static

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5v=Single 5 Volt Supply REFRESH=Pin 1 Refresh

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5V=Single 5 Volt Supply 21V PGM=Program at 21 Volts

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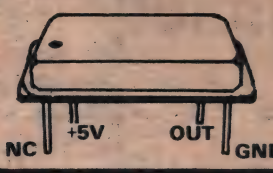

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74LS28	.35	74LS251	.59
74LS30	.25	74LS253	.59
74LS32	.29	74LS257	.59
74LS33	.55	74LS258	.59
74LS37	.35	74LS259	2.75
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74LS47	.75	74LS273	1.49
74LS48	.75	74LS275	3.35
74LS49	.75	74LS279	.49
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74S134	.50	74S241	2.20	87S181	16.25
				87S185	16.95

7400

7400	.19	7483	.50	74172	5.95
7401	.19	7485	.59	74173	.75
7402	.19	7486	.35	74174	.89
7403	.19	7489	2.15	74175	.89
7404	.19	7490	.35	74176	.89
7405	.25	7491	.40	74177	.75
7406	.29	7492	.50	74178	1.15
7407	.29	7493	.35	74179	1.75
7408	.24	7494	.65	74180	.75
7409	.19	7495	.55	74181	2.25
7410	.19	7496	.70	74182	.75
7411	.25	7497	2.75	74184	2.00
7412	.30	74100	1.75	74185	2.00
7413	.35	74105	1.14	74189	2.99
7414	.49	74107	.30	74190	1.15
7416	.25	74109	.45	74191	1.15
7417	.25	74110	.45	74192	.79
7420	.19	74111	.55	74193	.79
7421	.35	74116	1.55	74194	.85
7422	.35	74120	1.20	74195	.85
7423	.29	74121	.29	74196	.79
7425	.29	74122	.45	74197	.75
7426	.29	74123	.49	74198	1.35
7427	.29	74125	.45	74199	1.35
7428	.45	74126	.45	74221	1.35
7430	.19	74128	.55	74246	1.35
7432	.29	74132	.45	74247	1.25
7433	.45	74136	.50	74248	1.85
7437	.29	74141	.65	74249	1.95
7438	.29	74142	2.95	74251	.75
7439	.79	74143	4.95	74259	2.25
7440	.19	74144	2.95	74265	1.35
7442	.49	74145	.60	74273	1.95
7443	.65	74147	1.75	74276	1.25
7444	.69	74148	1.20	74278	3.11
7445	.69	74150	1.35	74279	.75
7446	.69	74151	.55	74283	2.00
7447	.69	74152	.65	74284	3.75
7448	.69	74153	.55	74285	3.75
7450	.19	74154	1.25	74290	.95
7451	.23	74155	.75	74293	.75
7453	.23	74156	.65	74298	.85
7454	.23	74157	.55	74351	2.25
7460	.23	74159	1.65	74365	.65
7470	.35	74160	.85	74366	.65
7472	.29	74161	.69	74367	.65
7473	.34	74162	.85	74368	.65
7474	.33	74163	.69	74376	2.20
7475	.45	74164	.85	74390	1.75
7476	.35	74165	.85	74393	1.35
7480	.59	74166	1.00	74425	3.15
7481	1.10	74167	2.96	74426	.85
7482	.95	74170	1.65	74490	2.55

CMOS

4000	.29	4531	.95
4001	.25	4532	1.95
4002	.25	4538	1.95
4006	.89	4539	1.95
4007	.29	4541	2.64
4008	.95	4543	1.19
4009	.39	4553	5.79
4010	.45	4555	.95
4011	.25	4556	.95
4012	.25	4558	2.45
4013	.38	4560	4.25
4014	.79	4569	3.49
4015	.39	4581	1.95
4016	.39	4582	1.95
4017	.69	4584	.75
4018	.79	4585	.75
4019	.39	45151	12.95
4020	.75	4702	12.95
4021	.79	4724	1.50
4022	.79	74C00	.35
4023	.29	74C02	.35
4024	.65	74C04	.35
4025	.29	74C08	.35
4026	1.65	74C10	.35
4027	.45	74C14	.59
4028	.69	74C20	.35
4029	.79	74C30	.35
4030	.39	74C32	.39
4034	1.95	74C42	1.29
4035	.85	74C48	1.99
4040	.75	74C73	.65
4041	.75	74C74	.65
4042	.69	74C76	.80
4043	.85	74C83	1.95
4044	.79	74C85	1.95
4046	.85	74C86	.39
4047	.95	74C89	4.50
4048	.69	74C90	1.19
4049	.35	74C93	1.75
4050	.35	74C95	.99
4051	.79	74C150	5.75
4052	1.99	74C151	2.25
4053	.79	74C154	3.25
4060	.89	74C157	1.75
4066	.39	74C160	1.19
4068	.39	74C161	1.19
4069	.29	74C162	1.19
4070	.35	74C163	1.19
4071	.29	74C164	1.39
4072	.29	74C165	2.00
4073	.29	74C173	.79
4075	.29	74C174	1.19
4076	.79	74C175	1.19
4077	.59	74C192	1.49
4078	.29	74C193	1.49
4081	.29	74C195	1.39
4082	.29	74C200	5.75
4085	.95	74C221	1.75
4086	.95	74C244	2.25
4093	.49	74C373	2.45
4094	2.99	74C374	2.45
4098	2.49	74C901	.39
4099	1.95	74C902	.85
14409	12.95	74C903	.85
14410	12.95	74C905	10.95
14411	11.95	74C906	.95
14412	12.95	74C907	1.00
14419	7.95	74C908	2.00
14433	14.95	74C909	2.75
14490	4.95	74C910	9.95
4502	.95	74C911	8.95
4503	.65	74C912	8.95
4507	1.25	74C914	1.95
4508	1.95	74C915	1.19
4510	.85	74C918	2.75
4511	.85	74C920	17.95
4512	.85	74C921	15.95
4514	1.25	74C922	4.49
4515	1.79	74C923	4.95
4516	1.55	74C925	5.95
4518	.89	74C926	7.95
4519	.39	74C927	7.95
4520	.79	74C928	7.95
4521	4.99	74C929	19.95
4522	1.25	74C930	4.95
4526	1.25	80C95	.85
4527	1.95	80C96	.95
4528	1.19	80C97	.95
4529	2.95	80C98	1.20

HIGH SPEED CMOS

A new family of high speed CMOS logic featuring the speed of low power Schottky (8ns typical gate propagation delay), combined with the advantages of CMOS: very low power consumption, superior noise immunity, and improved output drive.

74HC00

74HC: Operate at CMOS logic levels and are ideal for new, all-CMOS designs.

74HC00	.59	74HC175	.99
74HC02	.59	74HC193	1.25
74HC04	.59	74HC194	1.04
74HC08	.59	74HC195	1.09
74HC10	.59	74HC238	1.35
74HC11	.59	74HC240	1.89
74HC14	.79	74HC241	1.89
74HC20	.59	74HC242	1.89
74HC27	.59	74HC243	1.89
74HC30	.59	74HC244	1.89
74HC32	.69	74HC245	1.89
74HC51	.59	74HC251	.89
74HC74	.75	74HC257	.85
74HC75	.85	74HC259	1.39
74HC85	1.35	74HC273	1.89
74HC86	.69	74HC299	4.99
74HC93	1.19	74HC367	.99
74HC125	1.19	74HC373	2.29
74HC132	1.19	74HC374	2.29
74HC138	.99	74HC393	1.39
74HC139	.99	74HC4017	1.99
74HC151	.89	74HC4020	1.39
74HC153	.89	74HC4024	1.59
74HC154	2.49	74HC4040	1.39
74HC157	.89	74HC4049	.89
74HC161	1.15	74HC4050	.89
74HC164	1.25	74HC4060	1.29
74HC166	2.95	74HC4511	2.39
74HC174	.99	74HC4538	2.29

74HCT00

74HCT: Direct, drop-in replacements for LS TTL and can be intermixed with 74LS in the same circuit.

74HCT00	.69	74HCT175	1.09
74HCT02	.69	74HCT193	1.39
74HCT04	.69	74HCT194	1.19
74HCT08	.69	74HCT195	1.29
74HCT10	.69	74HCT238	1.49
74HCT11	.69	74HCT240	2.19
74HCT14	.89	74HCT241	2.19
74HCT20	.69	74HCT242	2.19
74HCT27	.69	74HCT243	2.19
74HCT30	.69	74HCT244	2.19
74HCT32	.79	74HCT245	2.19
74HCT51	.69	74HCT251	1.09
74HCT74	.85	74HCT257	.99
74HCT75	.95	74HCT259	1.59
74HCT85	1.49	74HCT273	2.09
74HCT86	.79	74HCT299	5.25
74HCT93	1.29	74HCT367	1.09
74HCT125	1.29	74HCT373	2.49
74HCT132	1.29	74HCT374	2.49
74HCT138	1.15	74HCT393	1.59
74HCT139	1.15	74HCT4017	2.19
74HCT151	1.05	74HCT4020	1.59
74HCT153	1.05	74HCT4024	1.79
74HCT154	2.99	74HCT4040	1.59
74HCT157	.99	74HCT4049	.99
74HCT161	1.29	74HCT4050	.99
74HCT164	1.39	74HCT4060	1.49
74HCT166	3.05	74HCT4511	2.69
74HCT174	1.09	74HCT4538	2.59

VOLTAGE REGULATORS

TO-220 CASE PACKAGE

7805T	.75	7905T	.85
7808T	.75	7908T	.85
7812T	.75	7912T	.85
7815T	.75	7915T	.85
7824T	.75	7924T	.85

TO-3 CASE PACKAGE

7805K	1.39	7905K	1.49
7812K	1.39	7912K	1.49
7815K	1.39	7915K	1.49
7824K	1.39	7924K	1.49

TO-92 CASE PACKAGE

78L05	.69	79L05	.79
78L12	.69	79L12	.79
78L15	.69	79L15	.79

OTHER VOLTAGE REGS

78M05C	5volt	½amp	TO-220	.35
LM323K	5volt	3amp	TO-3	4.95
LM338K	Adj.	5amp	TO-3	3.95
78H05K	5volt	5amp	TO-3	9.95
78H12K	12volt	5amp	TO-3	9.95
78P05K	5volt	10amp	TO-3	14.95
UA78S40	FAIRCHILD		DIP	1.95

LINEAR

LM301	.34	NE570	3.95
LM301H	.79	NE571	2.95
LM307	.45	NE590	2.50
LM308	.69	NE592	.98
LM308H	1.15	LM709	.59
LM309H	1.95	LM710	.75
LM309K	1.25	LM711	.79
LM310	1.75	LM723	.49
LM311	.64	LM723H	.55
LM311H	.89	LM733	.98
LM312H	1.75	LM741	.35
LM317K	3.95	LM741N-14	.35
LM317T	1.19	LM741H	.40
LM318	1.49	LM747	.69
LM318H	1.59	LM748	.59
LM319H	1.90	LM1014	1.19
LM319	1.25	LM1303	1.95
LM320	see7900	LM1310	1.49
LM322	1.65	MC1330	1.69
LM323K	4.95	MC1349	1.89
LM324	.59	MC1350	1.19
LM329	.65	MC1358	1.69
LM331	3.95	MC1372	6.95
LM334	1.19	LM1414	1.59
LM335	1.40	LM1458	.59
LM336	1.75	LM1488	.69
LM337T	1.95	LM1489	.69
LM337K	3.95	LM1496	.85
LM338K	3.95	LM1558H	3.10
LM339	.99	LM1800	2.37
LM340	see7800	LM1812	8.25
LM348	.99	LM1830	3.50
LM350K	4.95	LM1871	5.49
LM350T	4.60	LM1872	5.49
LM358	.69	LM1877	3.52
LM359	1.79	LM1889	1.95
LM376	3.75	LM1896	1.75
LM377	1.95	ULN2003	1.29
LM378	2.50	XR2206	3.75
LM379	4.50	LM2877	2.05
LM380	.89	LM2878	2.25
LM380N-8	1.10	LM2900	.85
LM381	1.60	LM2901	1.00
LM382	1.60	MPQ2907	1.95
LM383	1.95	LM2917	2.95
LM384	1.95	MC3487	2.95
LM386	.89	LM3900	.59
LM387	1.40	LM3905	1.25
LM389	1.35	LM3909	.98
LM390	1.95	LM3911	2.25
LM392	.69	LM3914	3.95
LM393	1.29	LM3915	3.95
LM394H	4.60	LM3916	3.95
LM399H	5.00	MC4024	3.95
NE531	2.95	MC4044	4.50
NE555	.34	RC4136	1.25
NE556	.65	RC4151	3.95
NE558	1.50	LM4250	1.75
NE564	2.95	LM4500	3.25
LM565	.99	RC4558	.69
LM566	1.49	LM13600	1.49
LM567	.89	LM13700	1.45

H=TO-5 CAN, K=TO-3, T=TO-220

RCA

CA3023	2.75	CA3083	1.55
CA3039	1.29	CA3086	.80
CA3046	1.25	CA3089	2.99
CA3059	2.90	CA3096	3.49
CA3060	2.90	CA3130	1.30
CA3065	1.75	CA3140	1.15
CA3080	1.10	CA3146	1.85
CA3081	1.65	CA3160	1.19
CA3082	1.65	CA3183	.99

TI

TL494	4.20	75365	1.95
TL496	1.65	75450	.59
TL497	3.25	75451	.39
75107	1.49	75452	.39
75108	1.49	75453	.39
75110	1.95	75454	.39
75150	1.95	75477	1.29
75154	1.95	75491	.79
75160	4.95	75492	.79
75188	1.25	75493	.89
75189	1.25	75494	.89

BI FET

TL066	.99	LF347	2.19
TL071	.79	LF351	.60
TL072	1.19	LF353	1.00
TL074	2.19	LF355	1.10
TL081	.79	LF356	1.10
TL082	1.19	LF357	1.40
TL083	1.19	LF411	1.29
TL084	2.19	LF412	1.99

SPECTRONICS CORPORATION

EPROM ERASERS

	Timer	Capacity Chip	Intensity (uW/Cm²)	
PE-14		9	8,000	$83.00
PE-14T	x	9	8,000	$119.00
PE-24T	x	12	9,600	$175.00
PL-265T	x	30	9,600	$255.00
PR-125T	x	25	17,000	$349.00
PR-320T	x	42	17,000	$595.00

TRANSISTORS

2N918	.50	2N3772	1.85
MPS918	.25	2N3903	.25
2N2102	.75	2N3904	.10
2N2218	.50	2N3906	.10
2N2218A	.50	2N4122	.25
2N2219	.50	2N4123	.25
2N2219A	.50	2N4249	.25
2N2222	.25	2N4304	.75
PN2222	.10	2N4401	.25
MPS2369	.25	2N4402	.25
2N2484	.25	2N4403	.25
2N2905	.50	2N4857	1.00
2N2907	.25	PN4916	.25
PN2907	.13	2N5086	.25
2N3055	.79	PN5129	.25
3055T	.69	PN5139	.25
2N3393	.30	2N5209	.25
2N3414	.25	2N6028	.35
2N3563	.40	2N6043	1.75
2N3565	.40	2N6045	1.75
PN3565	.25	MPS-A05	.25
MPS3638	.25	MPS-A06	.25
MPS3640	.25	MPS-A13	.40
PN3643	.25	MPS-A55	.25
PN3644	.25	MPU-131	.99
MPS3704	.15	TIP29	.65
MPS3706	.15	TIP31	.75
		TIP32	.79

IC SOCKETS

	1-99	100
8 PIN ST	.13	.11
14 PIN ST	.15	.12
16 PIN ST	.17	.13
18 PIN ST	.20	.18
20 PIN ST	.29	.27
22 PIN ST	.30	.27
24 PIN ST	.30	.27
28 PIN ST	.40	.32
40 PIN ST	.49	.39
64 PIN ST	4.25	CALL

ST=SOLDERTAIL

8 PIN WW	.59	.49
14 PIN WW	.69	.52
16 PIN WW	.69	.58
18 PIN WW	.99	.90
20 PIN WW	1.09	.98
22 PIN WW	1.39	1.28
24 PIN WW	1.49	1.35
28 PIN WW	1.69	1.49
40 PIN WW	1.99	1.80

WW=WIREWRAP

INTERFACE

8T26	1.59
8T28	1.98
8T95	.89
8T96	.89
8T97	.89
8T98	.89
DM8131	2.95
DP8304	2.29
DS8833	2.25
DS8835	1.99
DS8836	.99
DS8837	1.65
DS8838	1.30

INTERSIL

ICL7106	9.95
ICL7107	12.95
ICL7660	2.95
ICL8038	3.95
ICM7207A	5.59
ICM7208	15.95

DATA ACQ

ADC0800	15.55
ADC0804	3.49
ADC0809	4.49
ADC0816	14.95
ADC0817	9.95
ADC0831	8.95
DAC0800	4.49
DAC0806	1.95
DAC0808	2.95
DAC1020	8.25
DAC1021	7.95
DAC1022	5.95
MC1408L6	1.95
MC1408L8	2.95

EXAR

XR2206	3.75
XR2207	3.75
XR2208	3.75
XR2211	5.25
XR2240	3.25

9000

9304	.95
9316	1.00
9328	1.49
9334	2.50
9368	3.95
9401	9.95
9601	.75
9602	1.50
9637	2.95
96S02	1.95

SOUND CHIPS

76477	3.95
76488	5.95
76489	8.95
SSI-263	39.95
AY3-8910	12.95
AY3-8912	12.95
MC3340	1.49
SP1000	39.00

OPTO-ISOLATORS

4N26	1.00	MCA-7	4.25
4N27	1.10	MCA-255	1.75
4N28	.69	IL-1	1.25
4N33	1.75	ILA-30	1.25
4N35	1.25	ILQ-74	2.75
4N37	1.25	H11C5	1.25
MCT-2	1.00	TIL-111	1.00
MCT-6	1.50	TIL-113	1.75

I have had nothing but good experiences with JDR and look foward to more of the same. It's not often a company is willing to help customers to the extent JDR has.

— Stephen L. Vajo

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DB25S RS232 FEMALE SOLDER CUP 2.25

DB25P RS232 MALE SOLDER CUP 1.90

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- 12" SCREEN
- 18 MHz BANDWIDTH
- 640 x 262 PIXELS
- 25 LINES x 80 COL.
- .38mm DOT PITCH WITH BLACK MATRIX FOR A SHARP IMAGE AND HIGH CONTRAST.

NO C.O.D. ORDERS PLEASE!

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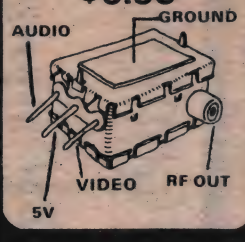
QUANTITIES LIMITED

- PRESET TO CHANNEL 3
- USE TO BUILD TV-COMPUTER INTERFACE
- +5 VOLT OPERATION

$6.95



EMI FILTER

- MAJOR MANUFACTURER
- LOW COST
- FITS LC-HP BELOW

$4.95

LINE CORDS

LC-2	2 CONDUCTOR	6 ft	.39
LC-3	3 CONDUCTOR	6 ft	.99
LC-HP	3 CONDUCTOR WITH STANDARD FEMALE SOCKET	6 ft	1.49
LC-CIR	CIGARETTE LIGHTER PLUG WITH 6 FOOT CORD		2.95

MUFFIN FANS

4.68" SQUARE	14.95
3" SQUARE	14.95

CAPACITORS

TANTALUM

1.0µf	15V	.40	.47µf	35V	.50
6.8	15V	.70	1.0	35V	.45
10	15V	.80	2.2	35V	.65
22	15V	1.35	4.7	35V	.85
.22	35V	.40	10	35V	1.00

DISC

10pf	50V	.05	560	50V	.05
22	50V	.05	680	50V	.05
25	50V	.05	820	50V	.05
27	50V	.05	.001µf	50V	.05
33	50V	.05	.0015	50V	.05
47	50V	.05	.0022	50V	.05
56	50V	.05	.005	50V	.05
68	50V	.05	.01	50V	.07
82	50V	.05	.02	50V	.07
100	50V	.05	.05	50V	.07
220	50V	.05	.1	12V	.10

MONOLITHIC

.01µf	50V	.14	.1µf	50V	.18
.047µf	50V	.15	.47µf	50V	.25

ELECTROLYTIC

RADIAL			AXIAL		
1µf	25V	.14	1µf	50V	.14
2.2	35V	.15	4.7	16V	.14
4.7	50V	.15	10	16V	.14
10	50V	.15	10	50V	.16
47	35V	.18	22	16V	.14
100	16V	.18	47	50V	.20
220	35V	.20	100	15V	.20
470	25V	.30	100	35V	.25
2200	16V	.60	220	25V	.30
			330	16V	.40
COMPUTER GRADE			500	16V	.42
			1000	16V	.60
			2200	16V	.70
44,000µf 30V 3.95			6000	16V	.85

RESISTORS

¼ WATT 5% CARBON FILM
ALL STANDARD VALUES
FROM 1 OHM TO 10 MEG OHM

50 PIECES SAME VALUE	.025
100 PIECES SAME VALUE	.02
1000 PIECES SAME VALUE	.015

BYPASS CAPS

.01 µf DISC	100/$6.00
.01 µf MONOLITHIC	100/$12.00
.1 µf DISC	100/$8.00
.1 µf MONOLITHIC	100/$15.00

DIODES

1N751	5.1 VOLT ZENER	.25
1N759	12.0 VOLT ZENER	.25
1N4148	(1N914)SWITCHING	25/1.00
1N4001	50PIV 1A	12/1.00
1N4004	400PIV RECTIFIER	10/1.00
1N5402	200PIV 3A	.25
KBP02	200PIV 1.5A BRIDGE	.45
KBP04	400PIV 1.5A BRIDGE	.55
MDA801	50PIV 12A BRIDGE	1.39
MDA980-1	50PIV 12A BRIDGE	1.95
MDA980-2	100PIV 12A BRIDGE	2.25
VM48	DIP-BRIDGE	.35

HEAT SINKS

TO-220	SCREW ON	.35
TO-220	CLIP ON	.35
TO-3	SCREW ON	.95
TO-220	INSULATOR	10/1.00
TO-3	INSULATOR	10/1.00

SWITCHES

SPDT	MINI-TOGGLE ON-ON	1.25
DPDT	MINI-TOGGLE ON-ON	1.50
DPDT	MINI-TOGGLE ON-OFF-ON	1.75
SPST	MINI-PUSHBUTTON N.O.	.39
SPST	MINI-PUSHBUTTON N.C.	.39
BCD OUT 10 POSITION 6 PIN DIP		1.95

LED DISPLAYS

HP5082-7760	CC	.43"	1.29
MAN-72	CA	.3"	.99
MAN-74	CC	.3"	.99
FND-357(359)	CC	.375"	1.25
FND-500(503)	CC	.5"	1.49
FND-507(510)	CA	.5"	1.49
TIL-311 4x7 HEX W/LOGIC		.270"	9.95

DIFFUSED LEDS

			1-99	100-up
JUMBO RED	T1¾		.10	.09
JUMBO GREEN	T1¾		.18	.15
JUMBO YELLOW	T1¾		.18	.15
MOUNTING HDW	T1¾		.10	.09
MINI RED	T1		.10	.09
MINI GREEN	T1		.18	.15
MINI YELLOW	T1		.18	.15
RECT RED	2x5mm		.25	.22
RECT GREEN	2x5mm		.30	.27
RECT YELLOW	2x5mm		.30	.27

HARD TO FIND "SNAPABLE" HEADERS

Can easily be snapped apart to make any size header, all with .1" centers

1x40	STRAIGHT LEAD	.99
1x40	RIGHT ANGLE	1.49
2x40	STRAIGHT LEAD	2.49
2x40	RIGHT ANGLE	2.99

SHORTING BLOCKS

SPACED AT .1" CENTERS
IDEAL FOR DISK DRIVES
OR ANY .1" HEADER

5/1.00

DIP SWITCHES

4 POSITION	.85
5 POSITION	.90
6 POSITION	.90
7 POSITION	.95
8 POSITION	.95
10 POSITION	1.29

EDGECARD CONNECTORS

S-100 ST	S-100	3.95
S-100 WW	S-100	4.95
72 PIN ST		6.95
72 PIN WW		7.95
62 PIN ST	IBM PC	4.95
50 PIN ST	APPLE	4.95
44 PIN ST		2.95
44 PIN WW		1.95

36 PIN CENTRONICS

IDCEN36	RIBBON CABLE MALE	8.95
IDCEN36/F	RIBBON CABLE FEMALE	8.95
CEN36	SOLDER CUP MALE	7.95

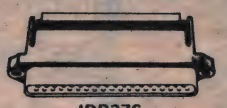
DIP CONNECTORS

DESCRIPTION	ORDER BY	CONTACTS								
		8	14	16	18	20	22	24	28	40
HIGH RELIABILITY TOOLED ST IC SOCKETS	AUGATxxST	.99	.99	.99	1.69	1.89	1.89	1.99	2.49	2.99
HIGH RELIABILITY TOOLED WW IC SOCKETS	AUGATxxWW	1.30	1.80	2.10	2.40	2.50	2.90	3.15	3.70	5.40
COMPONENT CARRIES (DIP HEADERS)	ICCxx	.49	.59	.69	.99	.99	.99	.99	1.09	1.49
RIBBON CABLE DIP PLUGS (IDC)	IDPxx	---	.95	.95	---	---	---	1.75	---	2.95

FOR ORDERING INSTRUCTIONS SEE IDC CONNECTORS BELOW

D-SUBMINIATURE

DESCRIPTION		ORDER BY	CONTACTS				
			9	15	25	37	50
SOLDER CUP	MALE	DBxxP	1.19	1.59	1.90	2.85	4.25
	FEMALE	DBxxS	1.50	1.85	2.25	3.90	5.25
RIGHT ANGLE PC SOLDER	MALE	DBxxPR	1.65	2.20	3.00	4.83	---
	FEMALE	DBxxSR	2.18	3.03	3.00	6.19	---
WIRE WRAP	MALE	DBxxPWW	1.69	2.56	3.89	5.60	---
	FEMALE	DBxxSWW	2.76	4.27	6.84	9.95	---
IDC RIBBON CABLE	MALE	IDBxxP	2.95	3.90	4.75	6.95	---
	FEMALE	IDBxxS	3.25	4.29	5.25	7.95	---
HOODS	BLACK	HOOD-B	---	---	.99	---	---
	GREY	HOODxx	.89	.99	.99	1.09	1.19


IDB37S

DB37S

DB25SR

MOUNTING HARDWARE-$1.00

FOR ORDERING INSTRUCTIONS SEE IDC CONNECTORS BELOW

TEXTOOL ZERO INSERTION FORCE SOCKETS AND RECEPTACLES

SCREWDRIVER CLAMP ECONO ZIF

LEVER CLAMP ZIF SOCKET

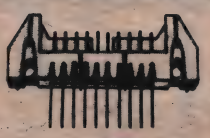
WW RECEPTACLES ZIF RECEPTACLE

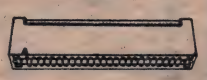
TYPE	CONTACTS				
	14	16	24	28	40
ECONO ZIF	---	4.95	6.75	7.75	9.95
ZIF SOCKET	4.95	4.95	5.95	6.95	9.95
ZIF RECEPTACLE	8.25	8.75	9.75	10.50	12.75

IDC CONNECTORS

DESCRIPTION	ORDER BY	CONTACTS					
		10	20	26	34	40	50
SOLDER HEADER	IDHxxS	.82	1.29	1.68	2.20	2.58	3.24
RIGHT ANGLE SOLDER HEADER	IDHxxSR	.85	1.35	1.76	2.31	2.72	3.39
WW HEADER	IDHxxW	1.86	2.98	3.84	4.50	5.28	6.63
RIGHT ANGLE WW HEADER	IDHxxWR	2.05	3.28	4.22	4.45	4.80	7.30
RIBBON HEADER SOCKET	IDSxx	.79	.99	1.39	1.59	1.99	2.25
RIBBON HEADER	IDMxx	---	5.50	6.25	7.00	7.50	8.50
RIBBON EDGE CARD	IDExx	1.75	2.25	2.65	2.75	3.80	3.95

ORDERING INSTUCTIONS: INSERT THE NUMBER OF CONTACTS IN THE POSITION MARKED "xx" OF THE "ORDER BY" PART NUMBER LISTED. EXAMPLE: A 10 PIN RIGHT ANGLE HOLDER STYLE WOULD BE IDH10SR


IDH20W


IDE50

RIBBON CABLE

CONTACTS	SINGLE COLOR		COLOR CODED	
	1'	10'	1'	10'
10	.18	1.60	.83	7.30
16	.28	2.50	1.00	8.80
20	.36	3.20	1.25	11.00
25	.45	4.00	1.32	11.60
26	.46	4.10	1.32	11.60
34	.61	5.40	1.65	14.50
40	.72	6.40	1.92	16.80
50	.89	7.50	2.50	22.00

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IBM PC PROTOTYPE CARD WITH DECODING CIRCUITRY $29.95

WIRE WRAP PROTOTYPE CARDS

FR-4 EPOXY GLASS LAMINATE WITH GOLD-PLATED EDGE-CARD FINGERS

IBM-PR2

IBM

BOTH CARDS HAVE SILK SCREENED LEGENDS AND INCLUDES MOUNTING BRACKET

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S-100

P100-1	BARE - NO FOIL PADS	$15.15
P100-2	HORIZONTAL BUS	$21.80
P100-3	VERTICAL BUS	$21.80
P100-4	SINGLE FOIL PADS PER HOLE	$22.75

APPLE

P500-1	BARE - NO FOIL PADS	$15.15
P500-3	HORIZONTAL BUS	$22.75
P500-4	SINGLE FOIL PADS PER HOLE	$21.80
7060-45	FOR APPLE IIe AUX SLOT	$30.00

GENERAL PURPOSE

22/44 PIN EDGE-CARD (.156" SPACING)

P441-1	BARE - NO FOIL PADS 4.5" x 6.0"	$9.45
P441-3	VERTICAL BUS 4.5" x 6.0"	$13.95
P441-4	SINGLE FOIL PADS 4.5" x 6.0"	$14.20
P442-1	BARE - NO FOIL PADS 4.5" x 9.0"	$10.40
P442-3	VERTICAL BUS 4.5" x 9.0"	$14.20
P442-4	SINGLE FOIL PADS 4.5" x 9.0"	$13.50

36/72 PIN EDGE-CARD (.1" SPACING)

P721-1	BARE - NO FOIL PADS 4.5" x 6.0"	$9.45
P721-3	VERTICAL BUS 4.5" x 6.0"	$13.25
P721-4	SINGLE FOIL PADS 4.5" x 6.0"	$14.20
P722-1	BARE - NO FOIL PADS 4.5" x 9.0"	$10.40
P722-3	VERTICAL BUS 4.5" x 9.0"	$14.20
P722-4	SINGLE FOIL PADS 4.5" x 9.0"	$15.15

BARE GLASS BOARDS

NO EDGE-CARD FINGERS OR FOIL

P25x45	2.5" x 4.5"	$2.40
P45x65	4.5" x 6.5"	$4.70
P45x85	4.5" x 8.5"	$6.20
P45x170	4.5" x 17.0"	$11.35
P85x170	8.5" x 17.0"	$18.95

EXTENDER CARDS

IBM	$45.00
APPLE	$45.00
MULTIBUS	$86.00

DISK DRIVES

TANDON

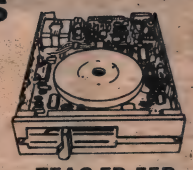
TM 100-1 5¼" (FOR IBM) SS/DD	$139.95
TM 100-2 5¼" (FOR IBM) DS/DD	$159.95

MPI

MPI-B52 5¼" (FOR IBM) DS/DD	$109.95

TEAC

FD-55B ½ HEIGHT DS/DD	$119.95
FD-55F ½ HEIGHT DS/QUAD	$139.95



TEAC FD-55B

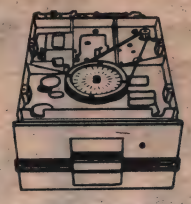
SHUGART

SA 400L 5¼" (40 TRACK) SS/DD	$199.95
SA 460 5¼" (80 TRACK) DS/QUAD	$199.95

8" DISK DRIVES

FD100-8 BY SIEMENS, SHUGART 801 EQUIV. SS/DD	$129.00
FD200-8 BY SIEMENS, SHUGART 851 EQUIV. DS/DD	$180.00

JFORMAT-2 $49.95
SUPPORT FOR QUAD DENSITY DRIVES FROM TALL TREE SYSTEMS



TANDON TM100-2

PLEASE INCLUDE SUFFICENT AMOUNT FOR SHIPPING ON ABOVE ITEMS

DISK DRIVE CABINETS

CABINET #1 $29.95
- Fits one full height 5¼"disk drive
- Color matches Apple

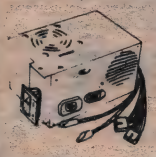
CABINET #2 $79.00
- Fits one full height 5¼"disk drive
- Complete with power supply, switch, line cord, fuse and standard power connector
- Please specify Grey or Tan

CABINET #3 $89.95
- Fits two half height 5¼"disk drives
- Complete with power supply, switch, line cord, fuse and standard power connectors

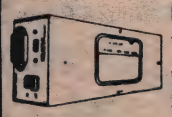
8" DISK DRIVE CABINETS ALSO AVAILABLE-PLEASE CALL

PLEASE INCLUDE SUFFICIENT AMOUNT FOR SHIPPING ON ABOVE ITEMS

SWITCHING POWER SUPPLIES



PS-IBM $159.95
- FOR IBM PC-XT COMPATIBLE
- 130 WATTS
- +5V @ 15A, +12V @ 4.2A -5V @ .5A, -12V @ .5A
- ONE YEAR WARRANTY



PS-A $49.95
- USE TO POWER APPLE TYPE SYSTEMS
- +5V @ 4A, +12V @ 2.5A -5V @ .5A, -12V @ .5A
- APPLE POWER CONNECTOR

PS-3 $39.95
- AS USED IN APPLE III
- +5V @ 4A, +12V @ 2.5A -5V @ .25A, -12V @ .30A,
- 15.5" x 4.5" x 2", .884 LBS.

PS-ASTEC $19.95
- CAN POWER TWO 5¼" FDDS
- +5V @ 2.5A, +12V @ 2A -12V @ .1A
- +5V @ 5A IF +12V IS NOT USED
- 6.3" x 4.0" x 1.9"

OK INDUSTRIES

EX-1 IC EXTRACTION TOOL

- ONE PIECE METAL CONSTRUCTION
- EASILY EXTRACTS 8-24 PIN DEVICES
- LOW COST $2.19

EX-1

EX-2 IC EXTRACTION TOOL

- EXTRACTS 24-40 PIN DEVICES
- HEAVY DUTY METAL CONSTRUCTION
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INS-1416	for 14-16 pin IC's	$5.15
MOS-1416	for 14-16 pin IC's	$10.92
MOS-2428	for 24-28 pin IC's	$10.92
MOS-40	for 40 pin IC's	$12.43

MOS series insertion tools have metal constuction and include grounding lug for CMOS applications.

INS-1416 INS-2428

BW-630 WIRE WRAP GUN

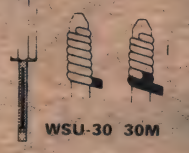
- BATTERY POWERED-USES 2 NI-CAD C CELLS(NOT INCLUDED)
- POSITIVE INDEXING
- ANTI-OVERWRAP DEVICE $41.55

BW-630

WSU-30 WIRE WRAP TOOLS

- WRAPS, STRIPS, AND UNWRAPS
- WSU-30M WRAPS AN EXTRA TURN OF INSULATION

WSU-30 $8.84/WSU-30M $10.14



WSU-30 30M

WIRE WRAP TERMINALS

WWT-1	SLOTTED	25/$7.06
WWT-2	SINGLE SIDED	25/$4.25
WWT-3	IC SOCKET	25/$7.06
WWT-4	DOUBLE SIDED	25/2.80
INS-1	INSERTION TOOL	$3.64

WIRE DISPENSER

- WITH 50' ROLL OF WIRE
- BUILT IN PLUNGER CUTS WIRE
- BUILT IN STRIPPER STRIPES 1"
- REFILLABLE

WD-30 $6.50 WD-30TRI $9.50
Specify Blue, white, Yellow or Red — With 50' of each: Red, Blue and White

SOCKET-WRAP I.D.™

- SLIPS OVER WIRE WRAP PINS
- IDENTIFIES PIN NUMBERS ON WRAP SIDE OF BOARD
- CAN WRITE ON PLASTIC; SUCH AS IC #

PINS	PART#	PCK. OF	PRICE
8	IDWRAP 08	10	1.95
14	IDWRAP 14	10	1.95
16	IDWRAP 16	10	1.95
18	IDWRAP 18	5	1.95
20	IDWRAP 20	5	1.95
22	IDWRAP 22	5	1.95
24	IDWRAP 24	5	1.95
28	IDWRAP 28	5	1.95
40	IDWRAP 40	5	1.95

PLEASE ORDER BY NUMBER OF PACKAGES (PCK. OF)

WIRE WRAP WIRE

PRECUT AND STRIPPED

Note: 1 inch of insulation is stripped on each end. A 3.5" wire has only 1.5" of insulation.

LENGTH (INCHES)	QUANTITY 100	500	1000
2.5	1.60	4.70	8.20
3	1.60	4.70	8.20
3.5	1.65	5.00	8.90
4	1.75	5.40	9.60
4.5	1.80	5.75	10.30
5	1.85	6.10	11.00
5.5	1.90	6.50	11.75
6	2.00	6.85	12.50
6.5	2.30	7.80	14.30
7	2.40	8.20	15.05
7.5	2.50	8.55	15.85
8	2.60	8.95	16.60
8.5	2.65	9.30	17.40
9	2.70	9.80	18.15
9.5	2.80	10.00	18.95
10	2.90	10.50	19.70

PRECUT ASSORTMENT IN ASSORTED COLORS $27.50

100ea: 5.5", 6", 6.5", 7"
250ea: 2.5", 4.5", 5"
500ea: .3", 3.5", 4"

SPOOLS

100 feet	$4.30	250 feet	$7.25
500 feet	$13.25	1000 feet	$21.95

Please specify color: Blue, Black, Yellow or Red

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12V AC	1 AMP	5.95
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AA CELLS	QTY. 2	$11.71
C CELLS	QTY. 2	$13.21
D CELLS	QTY. 2	$13.21
9 VOLT	QTY. 1	$13.21

BATTERIES ONLY

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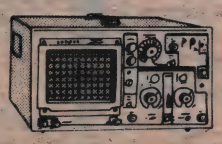
C CELLS	PKG. 1	$3.78 ea.
D CELLS	PKG. 1	$3.78 ea.
9 VOLT	PKG. 1	$7.57 ea.



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- SWEEP TIME- .2 μSEC TO .5 SEC/DIV ON 20 RANGES
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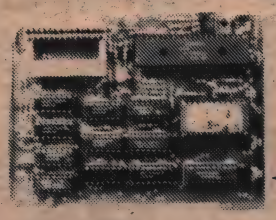
MPI-B52 DS/DD FULL HT. FOR IBM PC 109.95

EPROM PROGRAMMER
FOR APPLE COMPUTERS



RP525 $79.95

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- LOW COST!
- DUPLICATE OR BURN ANY STANDARD 27xx SERIES EPROM
- EASY TO USE MENU-DRIVEN SOFTWARE INCLUDED
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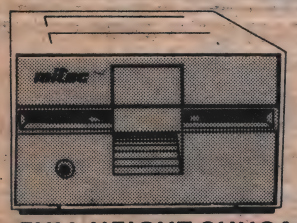

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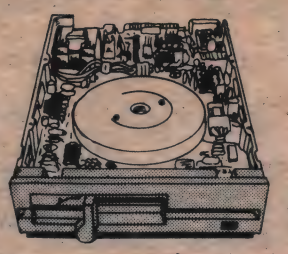

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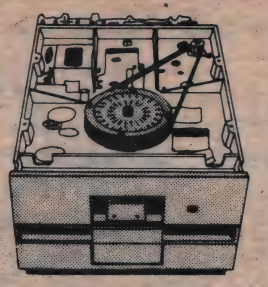

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Continued on page 136

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Ask The Guru
Continued from page 118

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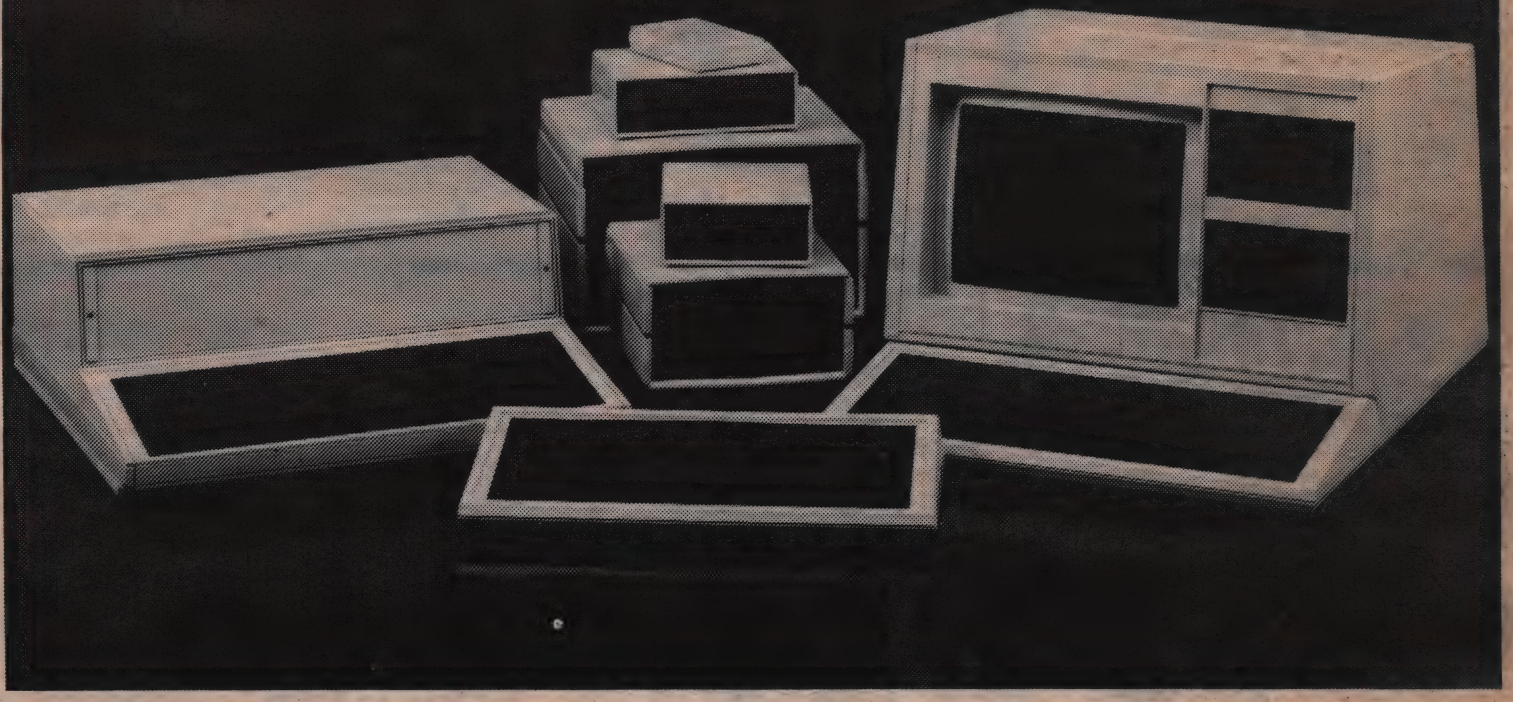

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7406	0.60	74144	2.50
7408	0.33	74145	0.88
7410	0.25	74148	1.10
7412	0.25	74150	1.62
7413	0.48	74151	0.58
7416	0.40	74154	1.35
7420	0.25	74156	0.70
7423	0.48	74157	0.50
7427	0.33	74160	0.95
7428	0.50	74161	0.76
7430	0.25	74163	0.76
7432	0.33	74164	0.75
7437	0.33	74165	0.85
7438	0.33	74166	1.00
7440	0.90	74173	0.85
7445	0.33	74174	0.90
7450	0.33	74175	0.90
7453	0.33	74177	0.75
7454	0.33	74180	0.90
7460	0.37	74182	0.75
7473	0.37	74190	0.95
7474	0.46	74191	1.05
7475	0.74	74192	0.80
7480	1.35	74194	0.85
7481	0.70	74197	0.96
7486	0.37	74199	1.50
7493	0.35	74221	0.90
7495	0.56	74273	2.20
7496	0.75	74293	1.05
74104	1.02	74365	0.75
74105	1.02	74366	0.60
74107	0.30	74367	0.60
74109	0.50	74368	0.65

74LS SERIES LOW POWER SHOTTKEY

74LS00	0.30	74LS158	0.58
74LS01	0.30	74LS161	0.65
74LS02	0.25	74LS164	0.73
74LS03	0.30	74LS166	1.85
74LS04	0.30	74LS174	0.60
74LS08	0.30	74LS175	0.60
74LS09	0.32	74LS190	0.85
74LS10	0.30	74LS191	0.79
74LS12	0.35	74LS192	0.85
74LS13	0.40	74LS194	0.75
74LS14	0.60	74LS195	0.75
74LS15	0.35	74LS197	0.98
74LS20	0.30	74LS221	0.90
74LS21	0.32	74LS240	0.98
74LS28	0.34	74LS241	0.98
74LS30	0.31	74LS244	1.25
74LS32	0.32	74LS245	1.45
74LS37	0.35	74LS253	0.65
74LS38	0.35	74LS257	0.55
74LS42	0.50	74LS258	0.55
74LS51	0.31	74LS260	0.65
74LS54	0.31	74LS266	0.75
74LS73	0.38	74LS273	1.55
74LS74	0.35	74LS279	0.60
74LS75	0.41	74LS280	1.80
74LS76	0.38	74LS283	0.82
74LS85	0.76	74LS290	0.95
74LS93	0.60	74LS293	0.95
74LS96	0.85	74LS298	.95
74LS107	0.38	74LS299	1.95
74LS109	0.38	74LS365	0.50
74LS113	0.45	74LS366	0.50
74LS123	0.75	74LS367	0.55
74LS135	0.75	74LS378	0.45
74LS136	0.55	74LS373	1.35
74LS132	0.65	74LS374	1.45
74LS138	0.55	74LS377	1.35
74LS139	0.61	74LS378	1.25
74LS151	0.60	74LS379	1.40
74LS157	0.75		

74S SERIES SHOTTKEY

74S00	0.35	74S175	1.40
74S04	0.40	74S182	2.65
74S08	0.40	74S189	3.75
74S20	0.40	74S194	1.80
74S37	0.90	74S240	2.30
74S112	0.66	74S241	1.95
74S124	2.60	74S244	1.95
74S138	1.20	74S251	1.30
74S140	0.64	74S280	2.95
74S151	0.90	74S288	2.95
74S153	1.20	74S273	2.45
74S174	1.00	74S274	2.25

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75150-	1.50	75451	0.35
75150-	1.50	75452	0.60
75154	1.50	75453	0.60
75182	1.50	75491	0.95
75189	1.25		

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4001	0.23	4060	1.16
4002	0.33	4066	0.50
4007	0.25	4068	0.40
4011	0.23	4069	0.33
4012	0.33	4070	0.40
4013	0.35	4071	0.33
4014	1.04	4072	0.33
4015	0.93	4073	0.33
4016	0.35	4075	0.33
4018	0.95	4077	0.60
4020	1.13	4081	0.33
4023	0.33	4093	0.40
4024	0.60	4098	1.95
4025	0.33	4099	1.45
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4030	0.92	40163	1.20
4029	1.19	40192	1.20
4040	0.95	4514	2.25
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		PRICE	
1 WATT	VOLTS		100
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1N4731	4.3	5/1.00	15.00
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2N3767	1.5	TIP73C	1.05
2N3771	1.95	TIP100	0.85
2N3904	10/1.50	TIP120	0.75
2N3906	10/1.50	TIP122	0.95
2N4400	0.25	TIP125	0.75
2N4401	0.25	TIP127	0.95
2N4403	0.25	MPSA05	0.25
2N5087	0.4	MPSA13	0.25
2N5139	0.25	MPSA18	0.45
2N5194	1.25	MPSA55	0.35
2N5686	7.95	MPSA65	0.45
2N5880	2.55	MPSA92	0.25
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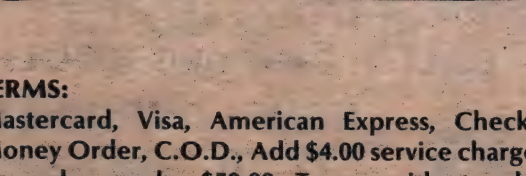

FUSES

GJV TYPE (PIGTAIL)

		EACH	100
GJV ½	½ AMP	.35	25.00
GJV 1	1 AMP	.30	22.00
GJV 2½	2½ AMP	.30	22.00
GJV 2	2 AMP	.30	22.00
GJV 1½	1½ AMP	.30	22.00
GJV 3	3 AMP	.30	22.00
GJV 4	4 AMP	.30	22.00
GJV 5	5 AMP	.30	22.00
GJV 6	6 AMP	.30	22.00
GJV 7	7 AMP	.30	22.00
GJV 8	8 AMP	.30	22.00
GJV 10	10 AMP	.30	22.00

MDL TYPE (SLO BLO) 1¼ x ¼ 250V

		EACH	100
MDL ½	½ AMP	.55	45.00
MDL 1	1 AMP	.45	37.50
MDL 2½	2½ AMP	.45	37.50
MDL 2	2 AMP	.45	37.50
MDL 1½	1½ AMP	.45	37.50
MDL 3	3 AMP	.45	37.50
MDL 4	4 AMP	.45	37.50
MDL 5	5 AMP	.45	37.50
MDL 6	6 AMP	.45	37.50
MDL 7	7 AMP	.45	37.50
MDL 8	8 AMP	.45	37.50
MDL 10	10 AMP	.45	37.50

AGC TYPE (NORMAL BLO) 1¼ x ¼ 250V

AGC ¼	¼ AMP	10/1.75	100/12.00
AGC ½	½ AMP	10/1.75	100/12.00
AGC ¾	¾ AMP	10/1.75	100/12.00
AGC 1	1 AMP	10/1.50	100/9.00
AGC 1½	1½ AMP	10/1.50	100/9.00
AGC 2	2 AMP	10/1.50	100/9.00
AGC 2½	2½ AMP	10/1.50	100/9.00
AGC 3	3 AMP	10/1.50	100/9.00
AGC 4	4 AMP	10/1.50	100/9.00
AGC 5	5 AMP	10/1.50	100/9.00
AGC 6	6 AMP	10/1.50	100/9.00
AGC 7	7 AMP	10/1.50	100/9.00
AGC 8	8 AMP	10/1.50	100/9.00
AGC 10	10 AMP	10/1.50	100/9.00

GMA TYPE (MIDGET) .769" x .197" 250V

GMA ½	½ AMP	10/1.50	100/9.50
GMA 1	1 AMP	10/1.50	100/9.50
GMA 1½	1½ AMP	10/1.50	100/9.50
GMA 2	2 AMP	10/1.50	100/9.50
GMA 2½	2½ AMP	10/1.50	100/9.50
GMA 3	3 AMP	10/1.50	100/9.50
GMA 4	4 AMP	10/1.50	100/9.50
GMA 5	5 AMP	10/1.50	100/9.50
GMA 6	6 AMP	10/1.50	100/9.50
GMA 7	7 AMP	10/1.50	100/9.50
GMA 8	8 AMP	10/1.50	100/9.50
GMA 10	10 AMP	10/1.50	100/9.50

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LM317MP	1.25
LM317K	2.95
LM337T	1.75
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7912	0.75
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8	1.95
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14.3181	1.95
16	1.95
20	1.95
22.622	1.95
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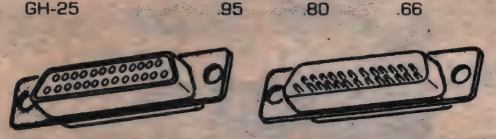

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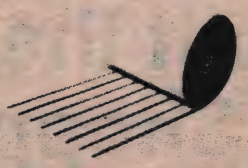

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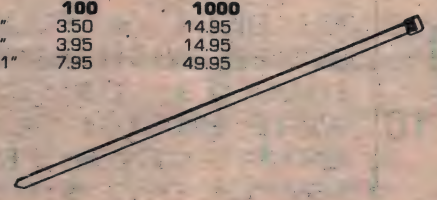

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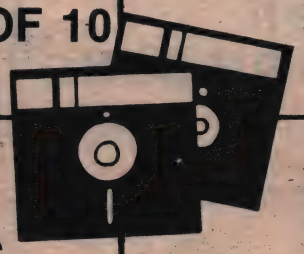

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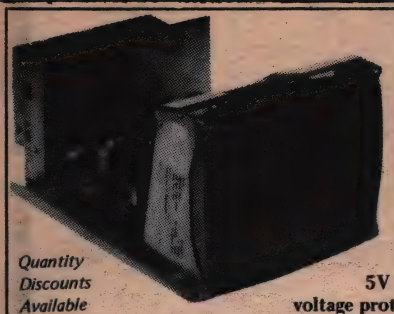

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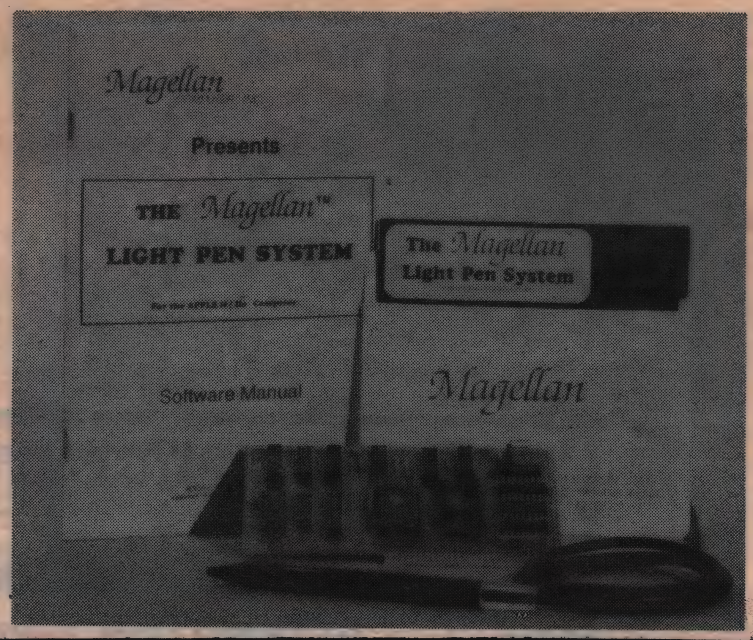

Magellan Computer, Inc., has introduced the Magellan Light Pen System II for the Apple II, II+, IIe and compatibles. Unlike toy graphics tablets and joysticks, the Light Pen interacts DIRECTLY with the monitor or TV screen. The system's high resolution capability allows creation of drawings with single dot accuracy on the Apple's graphic display. A built-in pushbutton gives the user maximum control over drawing operations, eliminating distracting keyboard interaction. The Light Pen includes a high performance interface card which plugs into any of the Apple's expansion slots and includes 4,000 bytes (expandable to 40,000 bytes) of ROM containing light pen and high speed graphics routines. In addition to freeing up valuable RAM memory, the built-in ROM allows users to easily incorporate the Light Pen into their own software.

The system comes with expensive software support, including the QUICK-DRAW program, which allows the user to easily create and edit commercial-quality graphics designs. QUICK-DRAW's features include: freehand drawing, color/pattern fill, pattern editor, zoom mode, window operations, symbol tables, hires text, high-speed disk commands, and more. In addition to graphics design, the Light Pen is ideal for high speed data entry and menu selection. Extensive software and documentation is provided which allows the user to easily incorporate Light Pen operation into his own BASIC or assembly language programs. The suggested retail price of $189.95 includes the pen, interface card with 4K ROM, QUICK-DRAW and AMPER-PEN software packages and complete documentation.

For further information contact Magellan Computer, Inc., 4371 E. 82nd Street, Suite D, Indianapolis, IN, 46250, (317)-842-9138.

Mention that you read it in the **Computer Shopper**.

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Continued from page 127

it. It isn't easy."

The player controls a "command helicopter" equipped with sophisticated weapons and a radar system. The command chopper is used to observe the battlefield, to attack enemy forces, and to transport troops, all while attempting to evade or destroy the enemy's own command chopper. In addition to the helicopter, the player deploys ground forces, ranging from armor to infantry, which attempt to fight their way across the battlefield.

All this takes place within a background where the player earns the right to continue by surviving, and where the cost of victory can outweigh the benefits. Play and scoring are designed to reflect the realities of war. Wartime economics are simulated by requiring the player to pay for men and equipment with funds earned by time in combat. The player's score is sharply reduced when a battle is won at the expense of excessive time and lost forces. Successful strategy must allow for more than simply outwitting and destroying the enemy.

"**Rescue Raiders** is an outstanding achievement in programming, even if you leave out the strategic side of it," says Robert Woodhead, **Wizardry** co-author. "The graphics and animation set a new standard for Apple II computers. You literally don't know what these machines can do until you've seen **Rescue Raiders.** The graphics are very advanced and very sophisticated, and add immensely to what is already an excellent game in its own right."

Rescue Raiders is also educational. When each of the eight battles in the game is won, the player is presented with a capsule history of a European city involved in World War II. Even trivia buffs may learn some new facts from these histories. Do you know how Paris got its name, for example?

Rescue Raiders is available now. It will run on the Apple IIc and IIe, and on any Apple II or II+ with 64K or more of RAM. A joystick is required.

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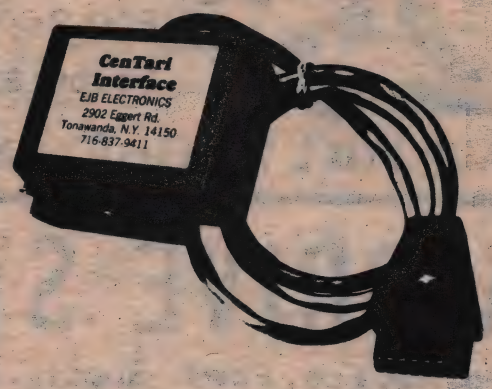

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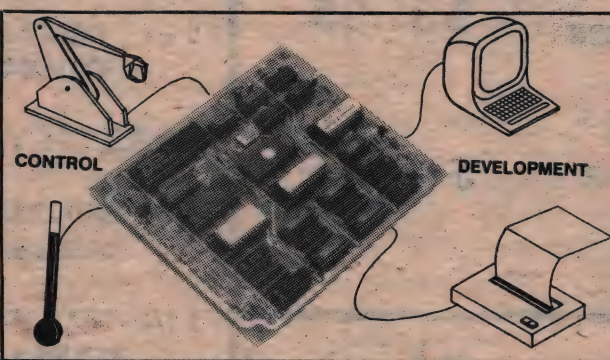

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IBM's Enhanced
Continued from page 132

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The HALO library of over 150 graphics subroutines provides programmers with a tool for writing device-independent graphics software. HALO currently supports all of the most popular graphics devices, and as new products are released, Media Cybernetics will write drivers for those as well. Licensed HALO authors can write software that will run on all HALO compatible devices and can be installed to the end users' specific hardware via an "Install" program.

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HALO is written in Assembler and is callable from: Compiled and Interpretive Basic; Computer Innovations C86, Mark Williams C; Lattice C; FORTRAN; IBM Professional Fortran; PASCAL; and Turbo Pascal.

For more information please contact Media Cybernetics, Inc., 7050 Carroll Avenue, Takoma Park, MD, 20912. Telephone (301)-270-0240.

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Corvus' New TrimLine Combo Provides IBM PC Users With Backup

Corvus Systems, Inc. has introduced the TrimLine Combo, a combination fixed disk drive and tape backup unit that provides IBM PC users with an easy-to-use, fast method of storing and safeguarding information.

One of the most compact and lowest-priced combination units currently on the market, the TrimLine Combo provides 20 megabytes (Mbytes) of formatted disk storage and tape backup in either 45 or 60 Mbytes capacities. Unlike other backup systems, the Corvus TrimLine Combo is designed to fit trimly under the PC's monitor, saving desk space.

For users who may not be familiar with MS-DOS commands, all backup options are also presented in menu form in easily understood language. This menu system makes set-

Continued on page 141

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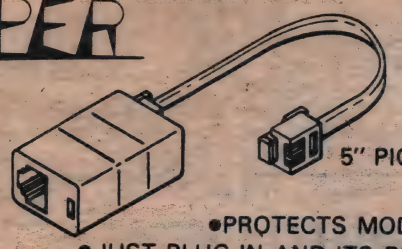

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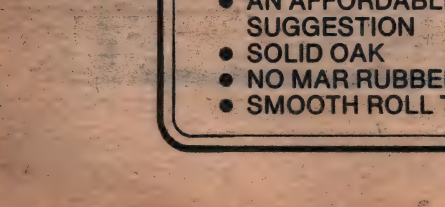

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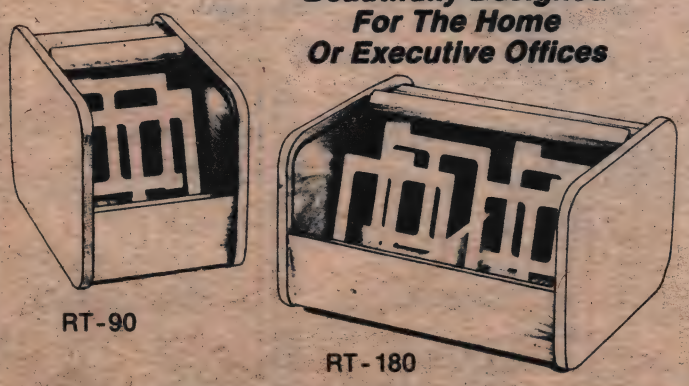

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Apple Endorsed Bufferpak Expansion Module

Bufferpak is an expansion module for the Apple II, II+, and IIe with Imagewriters. The Apple can output 1000 characters per second, while the Imagewriter only prints at about 120 cps. Bufferpak acts as a data storage tank receiving data as fast as the Apple can send it, and takes over the responsibility of feeding that data to the Imagewriter.

The Bufferpak plugs directly into Orange Micro's Serial Grappler, providing a 16K buffer which is user expandable to 32K or 64K. At capacity, the Bufferpak provides up to 20 pages of data storage.

The Bufferpak is modular, uses no additional Apple slots, requires no outside power source and adds no boxes or cables to the system. Suggested retail price is $135.00.

Apple Computer has endorsed the Bufferpak (with Serial Grappler) and will include information on these Orange Micro Products in a major direct mail campaign to small businesses.

For further information, contact Bill Leaman, CompuCable Corporation, 635 N. Twin Oaks Valley Road, San Marcos, CA, 92069. The telephone numbers are 800-338-1206 inside California, and 800-222-2332 outside California.

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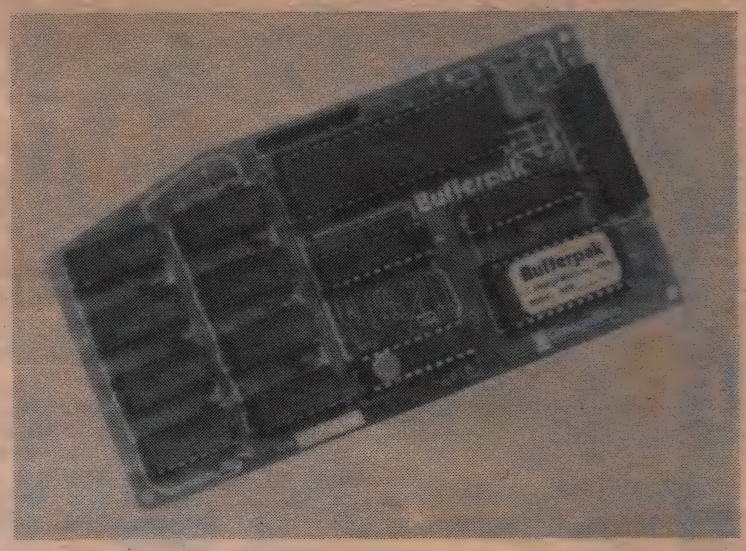

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MPI 501C-1 or -2 SSDD Half Hgt. These drives run very quiet $69.95 + UPS
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Tandon 100-1 pair in case with built in Power Supply ..... $212 + UPS
ST506 Seagate Technology 5mb Disk Drives, OEM Surplus ..... $150 + UPS
Monitors Ball 15" Model BC-500. Amber or green screen. New!! 1200 lines resolution. 32 MHZ bandwidth, DC power required 24V DC @ 1.25 Amps. Non-composite. Requires TTL level signals. 15.750 KHZ or 19,200 KHZ Horz. Excellent for 820, Big Board, etc. with manuals. Ship weight 19 lbs. New in original cartons. $109 + UPS
System case for above monitors. High impact plastic with detached low profile keyboard. ASCII encoded with numeric pad, function keys, escape, etc. All hardware for mounting monitor etc. Modern Pedistal design. Room for 820, Big Board, and other single board systems. Even possibly room for small S-100 system. Beige and brown. These are NEW! ..... $175 + UPS
Monitors - Ball Bros. Equivalent for Xerox 820 and other single board systems. 15.750 Kc horizontal freq., 16 MHZ Bandwidth ..... $65 + UPS
Disk Drive cases w/Power Supply for:
2-5¼" Reg. Hgt. Drives ..... $62.50 + UPS
2-5¼" Half Hgt. Drives ..... $60 + UPS
1-5¼" Reg. Hgt. Drives ..... $50 + UPS
1-5¼" Hard Disk Drive ..... $65 + UPS
2-5¼" Hard Disk Drive ..... $82.50 + UPS
Terminal - mfg. by well known mini computer mfg. 80x24 display on 12" B&W monitor. In attractive modern design beige and brown case w/separate matching 84 key keyboard. Full set ASCII characters. 75-9600 baud, cursor controls, function keys, cursor software control, split screen, etc., numeric pad, no parity check, composite output for remote monitor, RS232C ports. 30 day warranty w/manual. Excellent for word processing ..... $139.95 + Shipping
Floppy Disk Drive Power Supply Board - assembled with transformer for single drive. New with power cable and power cord ..... $10.95 + $3.50 Shipping
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Keyboards - New w/cases. 92 keys, 8 function keys, 17 key numeric pad. Converted to ASCII ..... $75 + UPS
Fans - IMC Boxer fans. 4¼" square, used but guaranteed. Min. order of 2 $4.50 + Shipping

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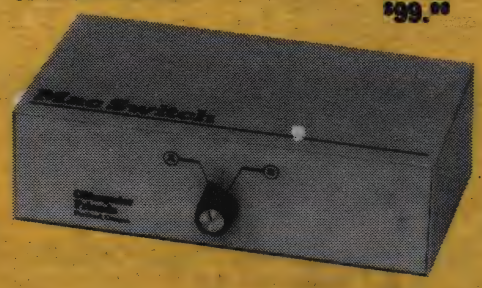

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Mac Inker & MacSwitch

Corvus' TrimLine
Continued from page 138

ting defaults (pre-selecting options) easy, further simplifying backup.

With the TrimLine Combo, IBM PC users can quickly back up the complete disk or perform backup on a file basis. Backing up selected files allows users to reduce both overall backup time and the amount of tape used. To permit users to quickly find and restore files, the TrimLine Combo provides a directory of the backup files at the beginning of every tape.

"IBM PC users have been eagerly waiting for a reliable, low-cost unit that integrates mass storage and tape backup," said William Lanfri, director of marketing. "The TrimLine Combo gives users speed and flexibility, including the option to back up the disk completely or incrementally by file, and the ability to reference tape directories to quickly locate files."

Corvus' primary mass storage and backup devices, Omnidrive™ and The Bank™, provide large mass storage capacities and backup for the Omninet™ local area network. TrimLine Combo expands this family of mass storage devices and provides an entry-level storage/backup solution for stand-alone PC.

The TrimLine Combo, priced at $3,295, will be available in May.

Founded in 1979, Corvus Systems manufactures the Omninet local area network for microcomputers. With a total of more than 180,000 nodes, Omninet is the largest installed base of LANs in the world. The company is also a major supplier of low-cost Winchester disk drives and tape backup systems for microcomputers, plus a line of workstations and computers, all of which have Omninet networking capability.

For further information contact Corvus Systems, Inc., headquartered at 2100 Corvus Drive, San Jose, CA 95124. Telephone 408/559-7000.

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84P		P	13.6 Carr.	200 CPS	669.
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MPI	502	98.	Tandon 100-3	99.
Toshiba	0202A	98.	Tandon 100-4	99.
Alps	AP-68 IBM	105.	Tandon 848-1E	292.
Shugart	SA-460	105.	Tandon 848-2E	375.
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+ TM100-3 + TM100-4

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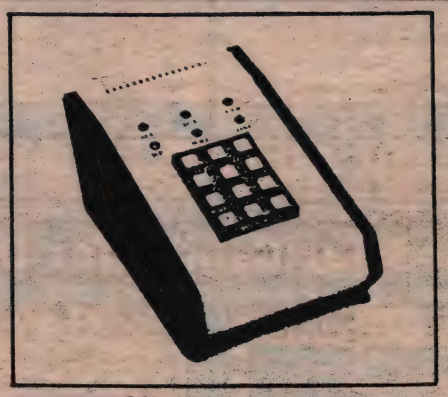

OMC-1000

HEIGHT:	3.15"
WIDTH:	5.00"
LENGTH:	8.25"
WEIGHT:	2 LB.

OPERATION

When you use the OMC-1000, you get the full range and power that only asoftware controlled microprocessor based testing and calibration system can provide.

The OMC-1000 works with all major floppy drives. This includes the 3", 5", and 8" drives regardless of whether they are single or double density, single or double sided, 48 TPI or 96 TPI. (Other TPI settings supported).

The OMC-1000 is of rugged construction and durable design, built to withstand the rigors of field service, and the demanding workload of depot level bench repair. The short and easy keystroke commands, coupled with the broad spectrum of mechanical and electronic capabilities make this universal tester the widely acclaimed industry leader.

$495.00

HARDWARE

Includes all cables and power connectors. Works with any and all alignment disks. (Alignment disk not included).

TESTING CAPABILITIES

Testing abilities of the OMC-1000 cover all areas of step, read and write data, write protect, track zero drive activity status lines, read margin testing, index period, head amplitude, head radial, head azimuth, index sector alignment, and the all important track zero head oscillation function (widely hailed as the most accurate method of track zero adjustment). Most OEM alignment procedures call for this method.

PHYSICAL

Rugged high impact case that features .080" thick aluminum alodine tan panels with high strength epoxy molded end pieces in color-coordinated mocha brown.

POWER

Unit receives its power from drive under test.

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(216) 439-7703

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COMPARE PRICE ★★★ COMPARE QUALITY ★★★ COMPARE FEATURES ★★★ COMPARE SERVICE

MODEL-Ft	1-9	10-24
CC58C-1	3.55	3.23
CC58C-1.5	3.70	3.37
CC58C-2	3.85	3.50
CC58C-2.5	4.10	3.73
CC58C-4	4.40	4.00
CC58C-5	4.65	4.23
CC58C-10	6.05	5.51
CC58C-15	7.45	6.78
CC58C-25	10.75	9.33
CC59B-1	3.65	3.32
CC59B-2.5	4.00	3.64
CC59B-5	4.75	4.32
CC59B-10	6.25	5.69
CC59B-15	7.75	7.05
CC59B-25	10.75	9.78
CC59B-50	18.25	16.61
CC59B-100	33.25	30.26
CC62A-1	3.60	3.28
CC62A-2.5	3.95	3.59
CC62A-5	4.70	4.28
CC62A-10	6.15	5.60
CC62A-15	7.60	6.92
CC62A-25	10.50	9.56
CC62A-50	17.75	16.15
CC62A-100	32.25	29.35
CC174-1	3.60	3.28
CC174-1.5	3.75	3.41
CC174-2	3.90	3.55
CC174-2.5	4.05	3.69
CC174-4	4.50	4.10
CC174-5	4.80	4.37
CC174-10	6.35	5.78
CC174-15	7.90	7.19
CC174-25	11.00	10.01

RG-58C EXTENSION CABLES NOT STOCKED BUT MADE TO ORDER

Shorter Lengths Made To Order

MODEL-Ft	1-9	10-24
CC59BX-5	4.95	4.50
CC59BX-10	6.45	5.87
CC59BX-15	7.95	7.23
CC59BX-25	10.95	9.96
CC59BX-50	18.45	16.79
CC62AX-5	4.90	4.46
CC62AX-10	6.35	5.78
CC62AX-15	7.80	7.10
CC62AX-25	10.70	9.74
CC62AX-50	17.95	16.33
CC62AX-100	32.45	29.53

RG-174 EXTENSION CABLES NOT STOCKED BUT MADE TO ORDER

MODEL-Ft	1-9	10-24
CC58C-1RA	4.90	4.46
CC58C-1.5RA	5.05	4.60
CC58C-2RA	5.20	4.73
CC58C-2.5RA	5.35	4.87
CC58C-3RA	5.50	5.00
CC58C-4RA	5.80	5.28
CC58C-5RA	6.10	5.55
CC58C-7.5RA	6.85	6.23
CC58C-10RA	7.60	6.92
CC59B-1RA	4.90	4.46
CC59B-1.5RA	5.05	4.60
CC59B-2RA	5.20	4.73
CC59B-2.5RA	5.35	4.87
CC59B-3RA	5.50	5.00
CC59B-4RA	5.80	5.28
CC59B-5RA	6.10	5.55
CC59B-7.5RA	6.85	6.23
CC59B-10RA	7.60	6.92
CC62A-1RA	4.90	4.46
CC62A-1.5RA	5.05	4.60
CC62A-2RA	5.20	4.73
CC62A-2.5RA	5.35	4.87
CC62A-3RA	5.50	5.00
CC62A-4RA	5.80	5.28
CC62A-5RA	6.10	5.55
CC62A-7.5RA	6.85	6.23
CC62A-10RA	7.60	6.92
CC174-1RA	4.90	4.46
CC174-1.5RA	5.05	4.60
CC174-2RA	5.20	4.73
CC174-2.5RA	5.35	4.87
CC174-3RA	5.50	5.00
CC174-4RA	5.80	5.28
CC174-5RA	6.10	5.55
CC174-7.5RA	6.85	6.23
CC174-10RA	7.60	6.92

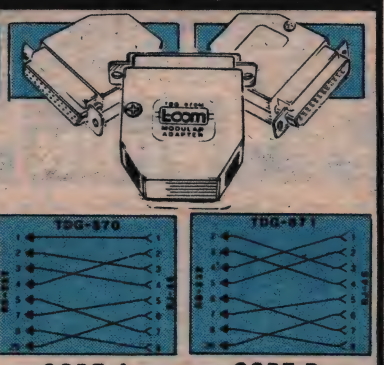
MODEL-Ft	1-9	10-24
CC58CX-1RA	5.10	4.64
CC58CX-1.5RA	5.25	4.78
CC58CX-2RA	5.40	4.91
CC58CX-2.5RA	5.55	5.05
CC58CX-3RA	5.70	5.19
CC58CX-4RA	6.00	5.46
CC58CX-5RA	6.30	5.73
CC58CX-7.5RA	7.05	6.42
CC58CX-10RA	7.80	7.10
CC59BX-1RA	5.10	4.64
CC59BX-1.5RA	5.25	4.78
CC59BX-2RA	5.40	4.91
CC59BX-2.5RA	5.55	5.05
CC59BX-3RA	5.70	5.19
CC59BX-4RA	6.00	5.46
CC59BX-5RA	6.30	5.73
CC59BX-7.5RA	7.05	6.42
CC59BX-10RA	7.80	7.10
CC62AX-1RA	5.10	4.64
CC62AX-1.5RA	5.25	4.78
CC62AX-2RA	5.40	4.91
CC62AX-2.5RA	5.55	5.05
CC62AX-3RA	5.70	5.19
CC62AX-4RA	6.00	5.46
CC62AX-5RA	6.30	5.73
CC62AX-7.5RA	7.05	6.42
CC62AX-10RA	7.80	7.10
CC174X-1RA	5.10	4.64
CC174X-1.5RA	5.25	4.78
CC174X-2RA	5.40	4.91
CC174X-2.5RA	5.55	5.05
CC174X-3RA	5.70	5.19
CC174X-4RA	6.00	5.46
CC174X-5RA	6.30	5.73
CC174X-7.5RA	7.05	6.42
CC174X-10RA	7.80	7.10

MODEL-Ft	1-9	10-24
CC58C-1RA2	6.25	5.69
CC58C-1.5RA2	6.40	5.82
CC58C-2RA2	6.55	5.96
CC58C-2.5RA2	6.70	6.10
CC58C-3RA2	6.85	6.23
CC58C-4RA2	7.15	6.51
CC58C-5RA2	7.45	6.78
CC58C-7.5RA2	8.20	7.46
CC58C-10RA2	8.95	8.14
CC59B-1RA2	6.25	5.69
CC59B-1.5RA2	6.40	5.82
CC59B-2RA2	6.55	5.96
CC59B-2.5RA2	6.70	6.10
CC59B-3RA2	6.85	6.23
CC59B-4RA2	7.15	6.51
CC59B-5RA2	7.45	6.78
CC59B-7.5RA2	8.20	7.46
CC59B-10RA2	8.95	8.14
CC62A-1RA2	6.25	5.69
CC62A-1.5RA2	6.40	5.82
CC62A-2RA2	6.55	5.96
CC62A-2.5RA2	6.70	6.10
CC62A-3RA2	6.85	6.23
CC62A-4RA2	7.15	6.51
CC62A-5RA2	7.45	6.78
CC62A-7.5RA2	8.20	7.46
CC62A-10RA2	8.95	8.14
CC174-1RA2	6.25	5.69
CC174-1.5RA2	6.40	5.82
CC174-2RA2	6.55	5.96
CC174-2.5RA2	6.70	6.10
CC174-3RA2	6.85	6.23
CC174-4RA2	7.15	6.51
CC174-5RA2	7.45	6.78
CC174-7.5RA2	8.20	7.46
CC174-10RA2	8.95	8.14

You May Never Have To Use RS232 Cables Again

A new interconnect concept allows conversion of standard serial devices using RS232 connectors to accept inexpensive Modular Telco cables for quick disconnect operation. Provides a number of advantages over traditional cabling methods:

1. Allows quick and simple change of cable length and connector sex. Simply unsnap and install a new cable, just as you would a telephone.
2. The most inexpensive alternative to traditional RS232 connectors & cables.
3. RS232/Modular Adapters are available in male or female version to satisfy all possible needs.
4. Redundant wired RJ-45 jacks allow best choice of strain relief. Also the open jack is useful for line testing, or to Daisy Chain serial devices.
5. RJ-45 Jacks are not keyed and will accept 4, 6, or 8 position Modular Cable Plugs.
6. Two basic wiring modes are available from stock. Custom versions can be quoted on request.
7. Redundant ports allow for either side entry and Daisy Chain use.



CODE A CODE B

MODEL	Type	Code	1-9	10-24	25-99
TDG870M	Male	A	16.95	14.92	13.22
TDG871M	Male	B	16.95	14.92	13.22

MODEL	Type	Code	1-9	10-24	25-99
TDG870F	Female	A	16.95	14.92	13.22
TDG871F	Female	B	16.95	14.92	13.22

Hard to Find Modular Cables for Data & Telco Use

DATA MODULAR CORDS-8 Position

- Gold Plated Contacts
- Mates with RJ45 Mod.
- Silver Gray Flat Cable
- Conforms to AT & T Standards

MODEL-Ft.	#Pos	1-9	10-24	25-99
TDC003-2	8	2.95	2.60	2.30
TDC003-7	8	3.55	3.12	2.77
TDC003-14	8	4.85	4.27	3.78
TDC003-25	8	6.95	6.12	5.42

COILED MODULAR CORDS-8 Position

- Gold Plated Contacts
- Mates with RJ45 Mod.
- Silver Gray Round Cable
- Conforms to AT & T Standards

MODEL-Ft.	#Pos	1-9	10-24	25-99
TDC001-6	8	3.95	3.48	3.08
TDC001-8	8	4.55	4.00	3.55
TDC001-10	8	4.95	4.36	4.86

NOTE: Lengths shown in extended position

TERMINATION CORDS-8 Position

- Tinned Solder Ends
- Silver Gray Flat Cable
- 8 Pin Plug Mates RJ-45
- Color Coded Wires for Easy Identification

MODEL-Ft.	#Pos	1-9	10-24	25-99
TDC005-2	8	2.25	1.98	1.76
TDC005-7	8	2.95	2.60	2.30
TDC005-14	8	3.95	3.48	3.08

TERMINATION CORDS-8 Position

- Lugs on Each Wire
- 8 Pin Plug Mates RJ45
- Flat Cable - Stranded Ends
- Color Coded for Easy Identification

MODEL-Ft.	#Pos	1-9	10-24	25-99
TDC004-2	8	2.25	1.98	1.76
TDC004-7	8	2.95	2.60	2.30
TDC004-14	8	2.95	2.60	3.08

DATA SWITCH BOXES

- Sturdy Steel Cases
- RFI Safety Proof
- Light Tan Color
- High Grade Rotary Switch
- Size: 2.25" × 7.25" × 5"
- 6 LED Hi-Lo Monitor (Optional)

		1-4	5-9
DT2512-2	2 Way (1in-2out)	99.00	94.05
DT2512-3	3 Way (1in-3out)	115.00	109.25

Switches: 2-6, 8, 15, 17, 20, 22, 24, & 25

DT2525-2	2 Way (1in-2out)	115.00	109.25
DT2525-3	3 Way (1in-2out)	130.00	123.50

Optional 6 LED (Hi-Lo) Monitor Add $30.00

DT3625-2	2 Way (1in-2out)	155.00	147.25
DT3625-3	3 Way (1in-2out)	175.00	166.25

Switches: 1-16, 18, 31-36, 19,30

DATA TRANSFER SWITCH BOXES

- Sturdy Steel Cases
- RFI Safety Proof
- Dark Tan Color
- Molded Rotary Switch
- Size: 3.2" × 6" × 5.9"
- Unconditionally Guaranteed

		1-4	5-9
DB2512-2V	2 Way (1in-2out)	99.00	94.05
DB2512-3V	3 Way (1in-3out)	115.00	109.25
DB2512-4V	4 Way (1in-4out)	135.00	128.25
DB2512-X	Crossover	120.00	114.00

Switches: 2-6, 8, 15, 17, 20, 22, 24, & 25

DB2525-2V	2 Way (1in-2out)	120.00	114.00
DB2525-3V	3 Way (1in-3out)	140.00	133.00
DB2525-4V	4 Way (1in-4out)	165.00	156.75
DB2525-X	Crossover	150.00	142.50

CN3625-2V	2 Way (1in-2out)	155.00	147.25
CN3625-3V	3 Way (1in-3out)	175.00	166.25
CN3625-4V	4 Way (1in-4out)	195.00	185.25
CN3625-X	Crossover	180.00	171.00

Switches: 1-16, 18, 31-36, 19,30

CN3625-2V	2 Way (1in-2out)	170.00	161.50
CN3625-3V	3 Way (1in-3out)	195.00	185.25
CN3625-4V	4 Way (1in-4out)	225.00	213.75
CN3625-X	Crossover	205.00	194.75

RS232 MATE SW. BOX

This unique switching box facilitates interfacing with either DCE or DTE devices. Our RS-10 will help you do it easily. Simply move Dip switches on a matrix allocation to open, close or even crossover lines. Complete with 12 ft. cable and two RS232 (DB-25) Male Terminations.

RS10.....89.00 (5-9)..... 84.55

RS232 LINE DEVICES

RS-232 DATA LINE MONITOR

A miniature Data Line Monitor determines the status of the seven key signals of the RS-232 data path. All 25 pins wired through, and dedicated red LED's report the status of: Transmit Data, Receive Data, Request to Send, Clear to Send, Data Set Ready, Data Carrier Detect, Data Terminal Ready, LED's glow at 3 Volts.

MODEL	GENDER	1-9	10-24
DLMS	M-F Shielded	37.35	33.99
NEW	Deluxe Monitor now available with red/green LED's to indicate a hi, low or open condition. Metal shield.		
DLMS-2	M-F Shielded	46.95	42.72

DATA LINE GENDER CHANGERS

Needed when connectors won't mate. Choice of shielded, unshielded, or Centronics.

DG-25F	(F-F) Unshielded	16.95	15.42
DG-25M	(M-M) Unshielded	16.95	15.42
DGS-25F	(F-F) Shielded	18.65	16.97
DGS-25M	(M-M) Shielded	18.65	16.97
DGS-36F	(F-F) Unshielded	36.95	33.62
DGS-36M	(M-M) Shielded	36.95	33.62

RS-232 DATA JUMPER BOX ADAPTER

Used to customize RS-232 interfaces. All 25 pins terminate to 25 solder pads. The PC board is already wired to the D-Subs. Includes 25 stripped leads for custom wiring. Many interfaces could be built. Null Modems, Pin Reversers, etc. Metal snap-on covers, hardware supplied.

DJBS	(M-F) Shielded	21.95	19.97
DJBS-M	(M-M) Shielded	21.95	19.97
DJBS-F	(F-F) Shielded	21.95	19.97

RS-232 DO IT YOURSELF KIT

Allows the creation of many RS-232 variations. The following components are included in the assortment: two 25-pin D-Sub Connectors, two metal Snap-on half covers, 1 set Hardware.

DIYS	(M-F) Shielded	12.95	11.78
DIYS-M	(M-M) Shielded	12.95	11.78
DIYS-F	(F-F) Shielded	12.95	11.78

RS-232/CENTRONICS ADAPTER BOX

Used to customize printer adapters. The DB-25 has 25 flying leads, ready to be soldered to any of the 36 pin female Centronics.

DJBA	(M-F) Shielded	24.95	22.70

RS-232 SURGE PROTECTOR

Guard against voltage spikes entering your RS-232 ports. Metal varistors on lines 2, 3 & 7 clamp surges above 25 volts without affecting normal operation. This compact protector mounts in series. All 25 lines are wired through.

DSP	(Male-Female)	24.95	22.70

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MOST NEEDED CABLE ASSEMBLIES

Dip-16 Round Jumper and Extension Cables

For use as terminating cables or extensions mating with conventional 16 pin dip sockets or plugs. All are fully populated with 16 conductors throughout. All terminations are fully molded for many years of useful service. Phosphor bronze male pins are .016" X .032". ML16PSC Coiled cord is 22" in normal unstretched position.

MODEL	Length-ft.	GENDER	1-9	10-24	25-99
ML16PP-1	1.0	Male-Male	6.85	6.23	5.89
ML16PP-2	2.0	Male-Male	7.15	6.51	6.15
ML16PP-3	3.0	Male-Male	7.45	6.78	6.41
ML16P-1	1.0	Male	3.95	3.59	3.40
ML16P-2	2.0	Male	4.25	3.87	3.66
ML16P-3	3.0	Male	4.55	4.14	3.91
ML16S-1	1.0	Female	3.95	3.59	3.40
ML16S-2	2.0	Female	4.25	3.87	3.66
ML16S-3	3.0	Female	4.55	4.14	3.91
ML-16PS-1.5	1.5	Male-Female	6.95	6.32	5.98
ML16PSS-1.5	1.5	Male-(2)Female	11.45	10.42	9.85
ML16PSC-4	4.0*	Male-Female	8.95	8.14	7.70

*Coiled Cord - 22 in. unstretched

Dip-16 Flat Jumper Cables with Molded Connectors

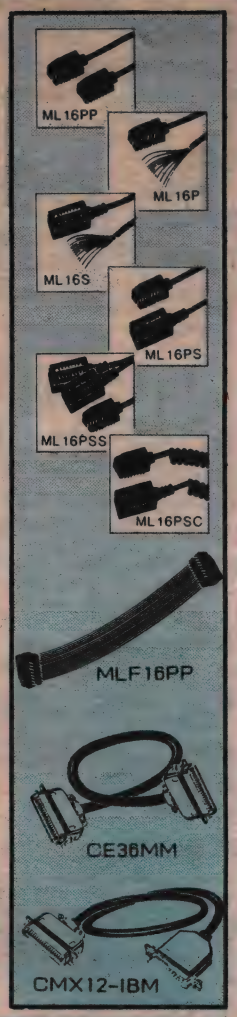
MLF16PP-05	0.5	Male-Male	3.30	3.00	2.84
MLF16PP-1	1.0	Male-Male	3.60	3.28	3.10
MLF16PP-2	2.0	Male-Male	4.20	3.82	3.61
MLF16PP-3	3.0	Male-Male	4.80	4.37	4.13
MLF16PP-4	4.0	Male-Male	5.40	4.91	4.64

Parallel Extension Cables with Centronics Type Connectors

CE36MM-5	5.0	Male-Male	30.50	29.28	27.76
CE36MM-7.5	7.5	Male-Male	34.25	32.88	31.17
CE36MM-10	10.0	Male-Male	37.50	36.00	34.13
CE36MM-15	15.0	Male-Male	44.00	42.24	40.04
CE36MM-25	25.0	Male-Male	57.50	55.20	52.33
CE36MF-5	5.0	Male-Female	30.50	29.28	27.76
CE36MF-7.5	7.5	Male-Female	34.25	32.88	31.17
CE36MF-10	10.0	Male-Female	37.50	36.00	34.13
CE36MF-15	15.0	Male-Female	44.00	42.24	40.04
CE36MF-25	25.0	Male-Female	57.50	55.20	52.33

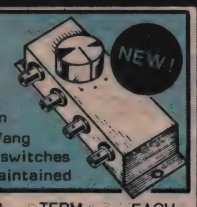
Parallel Centronics Type Cables for IBM-PC Printer

CMX6-IBM	6.0	Male-Male	39.95	38.35	36.35
CMX12-IBM	12.0	Male-Male	44.95	43.15	40.90



Note: We Stock a Most Complete Line of Standard Cables

DATA COAXIAL SWITCH



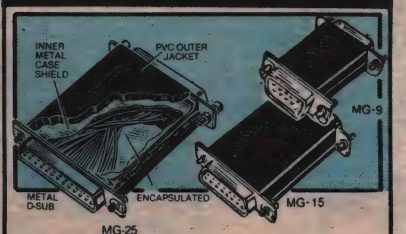
- Rugged Build
- Fully Shielded
- AB or ABC Types
- Low Contact Res
- Mounting Flanges
- Metal Construction
- BNC or TNC & Wang
- Center conductor switches
- Shield isolation maintained

MODEL	FUNCTION	TERM.	EACH
DS12B	SPDT AB	BNC	39.95
DS22B	DPDT AB	BNC	54.95
*DS22BT	DPDT AB	BNC-TNC	56.45
DS13B	SPDT ABC	BNC	49.95
DS23B	DPDT ABC	BNC	67.95
*DS23BT	DPDT ABC	BNC-TNC	69.95

*For Wang Devices-Switches Transmit & Receive Cables Simultaneously

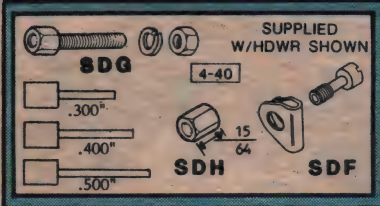
Qty Discounts & Custom Types Available

DELUXE GENDER CHANGERS



MODEL	Gender	1-9	10-24
MG9F	Female-Female	15.95	14.51
MG9M	Male-Male	15.95	14.51
MG15F	Female-Female	18.95	17.24
MG15M	Male-Male	18.95	17.24
MG25F	Female-Female	23.95	21.79
MG25M	Male-Male	23.95	21.79

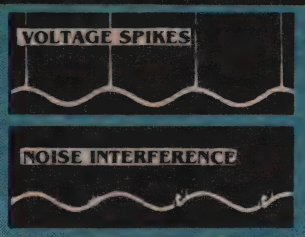
POPULAR RS232 LOCKDOWN SCREWS



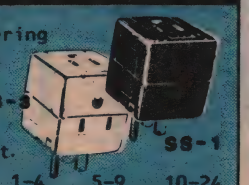
MODEL	50-450	500-1200	1200-over
SDG300	.18	.17	.16
SDG400	.19	.18	.17
SDG500	.20	.19	.18
SDH	.11	.10	.09
SDF1(Chromate)	.19	.18	.17
SDF2(Tin Plate)	.19	.18	.17

NOTICE: Multiples of 50 Only

AC LINE TRANSIENT SURGE PROTECTOR



- Prevents False Triggering
- Absorbs Spike & Noise
- Safe Voltage Level
- 2-Step Protection
- Rated: 15A @ 125VAC
- Polarized Gnd'd Recept.



MODEL	# TAPS	1-4	5-9	10-24
SS-1	Single	10.95	9.75	8.65
SS-3	3-Way	12.65	11.26	9.99

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STAINLESS STEEL WALL PLATES

With beautiful brushed finish to enhance any office decor. Fits any standard electrical wall box. Offered in variety to meet most exacting need, or customize your own using the blank plates. Custom hole punching available for quantity users. **NOTICE:** Wall plates are sold without connectors. To assure perfect fit, you are urged to use L-COM connectors, which must be ordered seperately.

BLANK WALL PLATES

- Mounting Screws Supplied
- Heavy Guage Stainless Steel
- For the Do-It-Yourselfer
- Protective Provided
- Drill Holes to your Specific Needs

MODEL	Cutouts	1-9	10-24	25-99
WP	None	3.59	3.41	3.16

BNC BULKHEAD RECEPTACLE

- Teflon Insulation
- Bright Nickel Finish
- Fits WPC & WPD Plates
- Ground Lug Supplied
- Takes Less Room Behind the Plate

MODEL	Type	1-9	10-24	25-99
BAC-1417	BNC	3.95	3.75	3.48

TNC BULKHEAD RECEPTACLE

- Teflon Insulation
- Bright Nickel Finish
- Fits WPC & WPD Plates
- Ground Lug Supplied
- Takes Less Room Behind the Plate

MODEL	Type	1-9	10-24	25-99
BAC-2200	TNC	3.95	3.75	3.48

BNC BULKHEAD ADAPTERS

- Teflon Insulation Inserts
- Bright Nickel Finish
- One Nut Mounting
- Accepts "Twist-on" BNC
- Fits WPC & WPD Plates (Shown Above)

MODEL	Type	1-9	10-24	25-99
BA-1087	BNC-BNC	6.80	6.46	5.98

TNC BULKHEAD ADAPTERS

- Teflon Insulation Inserts
- Bright Nickel Finish
- One Nut Mounting
- Accepts "Screw-on" TNC
- Fits WPC & WPD Plates (Shown Above)

MODEL	Type	1-9	10-24	25-99
BA-2301	TNC-TNC	6.80	6.46	5.98

DATA WALL PLATES

- Stainless Looks Professional
- For 1, 2, or 4 Connectors
- Use with BNC or TNC
- Bulkhead Adapters/Jacks
- Also Accepts KMS Security Keylock Switch

MODEL	Cutouts	1-9	10-24	25-99
WPC-1	1	3.95	3.75	3.48
WPC-2	2	3.95	3.75	3.48
WPC-4	4	3.95	3.75	3.48

RS232 D-SUB CONNECTORS

- UL-90VO Insulation
- Solder Cup Connections
- Tin Plate Outer Finish
- Gold Plated Pin Provided

For Easy Soldering & Good Conductivity

MODEL	Gender	1-9	10-24	25-99
SD25P-2	Male	2.95	2.80	2.60
SD25S-2	Female	3.85	3.66	3.39

DATA WALL PLATES

- Professional Appearance
- Handsome Brushed Stainless
- Use with any RS-232 D-Sub
- Mounting Screws Supplied
- Eliminate Clutter and Increase Safety

MODEL	Cutouts	1-9	10-24	25-99
WPD-1	1	3.95	3.75	3.48
WPD-2	2	3.95	3.75	3.48

DATA WALL PLATES

- Accepts RS-232 D-Sub
- And Also BNC or TNC
- Bulkhead Connectors or
- Bulkhead Adapters (Below)
- Also Accepts KMS Security Keylock Switch

MODEL	Cutouts	1-9	10-24	25-99
WPD-3	2	3.95	3.75	3.48
WPD-4	3	3.95	3.75	3.48

STAINLESS TELCO WALL PLATES

- Handsome Brushed Finish
- Accepts Telco Jack (Below)
- Top Half Left Blank For
- Custom Enhancement
- Eliminate Clutter and Increase Safety

MODEL	Cutouts	1-9	10-24	25-99
WPT	1	3.95	3.75	3.48

TWINAX WALL PLATES

- Easy To Install
- Hole Size 3/4" Dia
- Handsome Brushed Stainless
- One or Two Twinax Jacks
- Professionalize Your IBM Installation

MODEL	Cutouts	1-9	10-24	25-99
WPC-10	1 (Ctr.)	3.95	3.75	3.48
WPC-11	1	3.95	3.75	3.48
WPC-12	2	3.95	3.75	3.48

TELCO-COAX WALL PLATES

- Professional Enhancement
- One or Two Coaxial Cables
- Accepts Telco Jack (Below)
- Use with BNC or TNC
- Either Bulkhead Adapters or Jacks

MODEL	Cutouts	1-9	10-24	25-99
WPT-1	2	3.95	3.75	3.48
WPT-2	3	3.95	3.75	3.48

TWINAX RECEPTACLE (Jack)

- Teflon Insulation
- Solder Connections
- One Hole Mounting
- IBM Accepted Standard
- Use With WPC Stainless Plate

MODEL	Type	1-9	10-24	25-99
BAC-1910	Twinax	9.95	9.45	8.76

TELEPHONE JACK

- Modular RJ-11 Jack
- Screw Terminals
- UL-94VO Plastic Material
- Fits WPT Stainless Plates
- Mounting Hardware Supplied

MODEL	Pins	1-9	10-24	25-99
TDD-20	4	2.95	2.80	2.60

TWINAX ADAPTER

- Teflon Insulation
- A Useful Gender Changer
- Mates Two Male Twinax
- One Piece - Nickel Plate
- Keep One Handy In Your Tool Box

MODEL	Type	1-9	10-24	25-99
BA-2001	Twinax	12.95	12.30	11.40

SECURITY KEYLOCK SWITCH

- Bright Nickel Plate
- Fits WPC & WPD Plates
- Single Pole Single Throw
- 2 Tubular Keys Supplied
- Extra Keys Optional

MODEL	Function	1-9	10-24	25-99
KMS-02	SPST	6.95	6.60	6.12
KMS-K	Extra Key	.85	.81	.75

TWINAX CABLE CONNECTOR

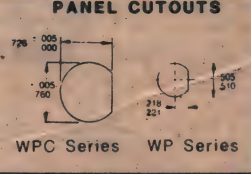
- Teflon Insulation
- Machined From Solid Metal
- Use With RG-22U or Equal
- Long Trouble-free Operation
- Very Popular IBM Connector

MODEL	Type	1-9	10-24	25-99
BAC-1911	Twinax	9.95	9.45	8.76

INSTALLATION PROCEDURE

- Orderly Connections
- Simple Installation
- Anti-Turn D Mounts
- BNC or TNC Connectors
- Use Preformed Cables
- Rt. Angle Contributes To A More Orderly Arrangement

PANEL CUTOUTS



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CBS Stuff
Continued from page 81

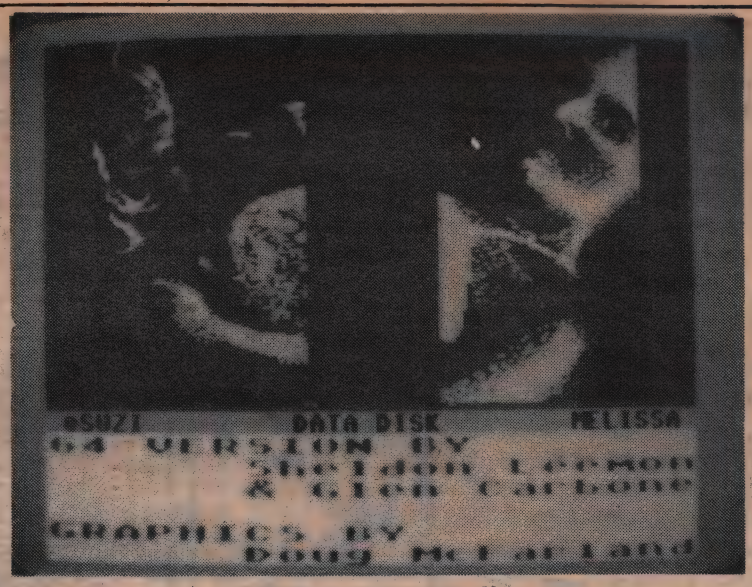
ponents has four pieces of clothing. You're at a slight disadvantage because the game assumes you're wearing a shirt, pants and undies only. Oh well, you'll just have to be that much smarter, right?

As you can see from the screen shots, your opponent appears at the top, your cards at the bottom. When it's time to bet, pushing the joystick forward or back, cycles you through the choices, STAY, BET, CALL, RAISE AND DROP. If you choose raise or bet, the joystick's motion then goes through dollar values 5 to 25 in five dollar increments.

When it comes time to decide which cards to throw away, you use the joystick to move a dot over the card you want to turn and push the fire button. Moving the cursor off on either side brings up the prompt FINISHED. Pressing the fire button indicates you are.

There is a cute little "Strip Tease" ditty that plays just before the drive is accessed to update your opponent's appearance. Appropriate remarks are also displayed when either of you loses or wins back a piece of clothing. By winning back more than $100 at the end of a hand, clothes can be reclaimed.

I have to admit that I had one natural advantage in playing Strip Poker. Having my opponent shed her clothes did little to distract my game. Since I haven't shelled out the $20 for the male player disk, I'm at a loss to evaluate the sex appeal factor of Artworx opponents. Sorry guys, you'll just have to beat the pants off them yourselves. Although I did succeed in beating both Suzi and Melissa several times, I don't think **Computer Shopper**'s editor would print the photos I could have taken. Instead, you can check out the shots of the girls with their clothes on.



Strip Poker "After"

As a long time poker player, I found the opponents to be pretty good. I can't see either of these girls winning the World Poker Championship in Las Vegas, but then if they could most people wouldn't enjoy playing them. I think the average guy could beat them with a little practice.

For myself, I'm curious to see what the men look like...I mean play like. Will Artworx have made the men a little more difficult to beat? Or will they be as easy to overcome as the women? Hmmmm? $20? Why not? Now, where did I put my checkbook, anyway?

Strip Poker

Artworx Software Company
150 North Main Street
Fairport, NY 14450
(800)-828-6573

Commodore 64
Also Atari, Apple, and IBM

Suggested list $29.95
Additional opponent disks-
$19.95

Rendezvous With RAMA

Rendezvous With RAMA is one of a new breed of games which takes the plot of a science fiction book and turns it into an interactive adventure. You take on the persona of the hero of the book and set off in exploration, usually with some goal in mind.

In the case of RAMA, you must gain entrance to the cylindrical extraterrestrial craft and explore its interior, hoping to get some insight into the mentality and characteristics of the beings who created it. This is a very nebulous purpose and I really have no idea how you can judge your success.

You start in your quarters, where you are awakened by the other members of the crew. You gather your supplies and head for the outside. Once you leave the craft, you're basically on your own. Although the crew members will keep in contact with you by radio and can sometimes offer advice, all the decisions are yours. It doesn't hurt to have a bit of background in fictional space travel or elementary physics, although neither is needed to get around.

There are many good things to say about this program. The opening credits are astonishing. Rather similar to an afternoon at the movies, thank goodness you only have to sit through them at the beginning. Mind you, I'm not saying they aren't entertaining. For one thing, the music is great! The oboe sound in the main theme is the best I've heard. The graphics aren't bad either. If you want to avoid them altogether, there is an escape provided. Hitting "g" will take you straight into the game.

The game uses a "Zork-type" language interface, although for this game it has been renamed "Rendezvous Elec-

Continued on page 146

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20MB $895/1 .... 32MB	$1055	1
CM 6426 20MB DRIVE FOR IBM-AT	$ 895	1
IBM AT 128K CHIP SET OF 9	$ 125	1
IBM PC/XT LIKE CABINET	$ 75	1
HARD DISK SUBSYSTEMS		
IBM PC	EXT.	INT.
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15 MB	$1070	$ 750
21MB	$1545	$1225
32MB	$1850	$1525
TAPE BACK UP FOR IBM	$ 800	1
APPLE		
10 MB	$1050	1
15 MB	$1150	1
21 MB	$1650	1

****SPECIAL SALE****
INVENTORY CLEARANCE!
ALL NEW PRODUCTS!

	UNIT PRICE	MIN QTY
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MEMOREX DSDD 3491	$ 1.80	100
3M SSDD 10 RH & 16 RH	$ 1.50	50
APPLE FILEWARE FOR LISA	$ 3.00	50
DISK PACK MEMOREX MARK III T	$ 50	1
8 INCH FLOPPY DRIVES		
SHUGART SA801 COMPATIBLE	$ 75	1
SHUGART SA851 COMPATIBLE	$125	1
SHUGART SA801 220V	$150	1
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WD 1002 SHD	$200	1
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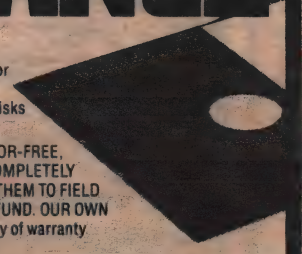
DISKETTE CLEARANCE



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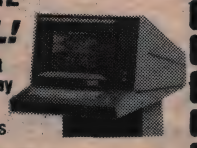

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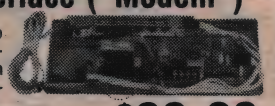

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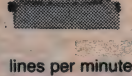

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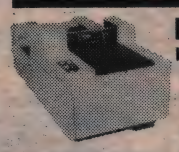

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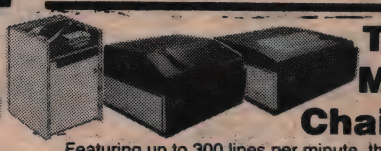

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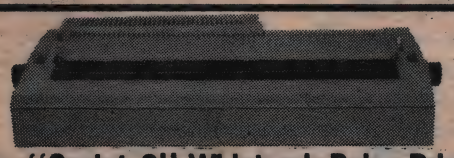

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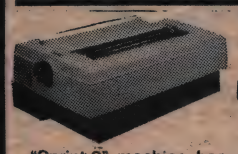

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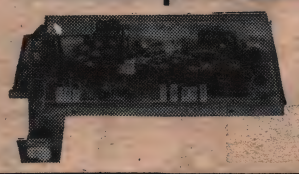

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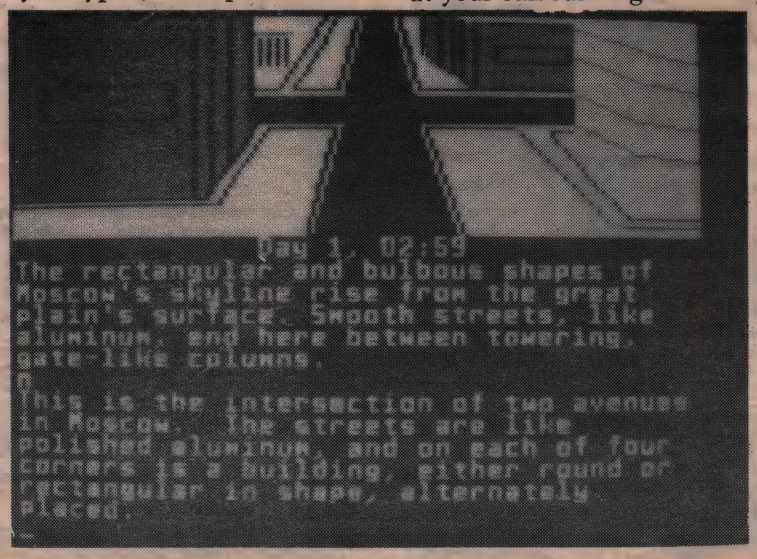
CBS Stuff
Continued from page 144

tronic Communication (REC)." The parser can understand nouns, verbs, subjects and even some adverbs. Unlike other text adventures, this one doesn't expect you to spend hours figuring out what words it understands. A fairly complete listing is provided in the documentation and a help file on the disk provides the latest updating information. The program can deal with multiple objects and directives, as well. It seems to be a bit slower than InfoCom's, however.

If the program doesn't understand you, it may try to get you to give it additional information by asking you a question. For instance, "Enter where?" If it clearly recognizes that what you are doing is impossible for this location, it may respond "You can't do that here." If you're trying to use a tool you don't have, it'll let you know that, too. It is still possible to say totally irrelevant things or to make typing errors. If it can't understand a thing you typed, it responds "You reconsider your words."

Unfortunately, you will still get messages like "You can't," that never explains why not. This frequently causes a lot of frustration, because invariably you can't figure out what's wrong with the command. Also, sometimes trying to be very exacting in your instructions is a disadvantage. I can't be more specific without giving things away, so you'll just have to take my word for it.

And therein lies another disadvantage. In most InfoCom games, (I hate to keep using them as a comparison, but they are the best in the genre). Whenever any action you take results in a significant change to the surroundings, those charges are duly noted and will continue to appear as information anytime you look at your surroundings.



For instance, you drop your lighter on the ground to make room for a more useful object and to mark the spot if you later return there. Anytime you look at the surroundings in this area, the program will mention that there is a "shiny lighter of strange workmanship" on the ground.

RAMA gives no such clues. Dropping any item, gives a "dropped" message. But the item doesn't then appear in any future descriptions of the location. The landscape in the cities is amazingly dull. Every street looks like every other. So much so, that when you move around the city it doesn't even bother to update the description of where you are. It just replies, "You move east." This is very definitely a game to be drawing a map of your every step.

You can talk freely with the crew members back on your ship, but there are occasions when radio interference is experienced. Usually when you need the most help. Further, what they have to say is seldom inspiring. You can get position updates that will tell you where you are in relation to the nearest geographical feature. A handy bit of information.

Like all good adventure games, RAMA lets you save your game status periodically, so that if you do something fatally stupid, you can restore

Continued on page 148

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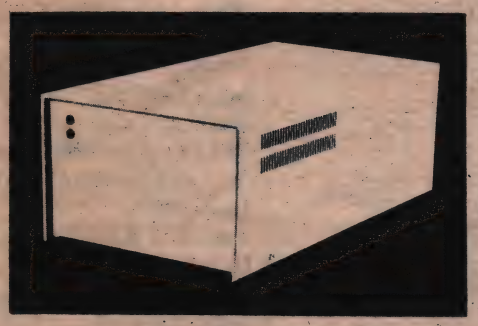

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CONTROL DATA

Inside the VIC-20
Continued fron page 80

the version that most people want. They don't care about "how it works," they just want it to work, period! So, here is an easy to use version that works, period. Not many "bells and whistles," but it works like it's supposed to.

What It Does and What It Don't

Here, in summary, is what the printer driver does:

It allows you to replace a standard device driver found in ROM with a new device driver (device # x, where you decide what 'x' is). Or, you may add a non-existing device # to ones that are already supported by the KERNAL ROM, thus extending the KERNAL.

The net effect is:

It allows you to connect a Centronics compatible printer to your C-64 (and soon, VIC-20) and PRINT simple

Continued on page 150

CBS Stuff
Continued from page 146

the game at the latest saved point. The restore command lets you come back to a game later and take up where you left off. The program will also format a data disk for you, in case you boot up without having one ready.

As for RAMA's plot, it is rather challenging. There are many places to be explored. Enough that the program uses all four sides of two disks to run. You still need a formatted blank disk to put your saved games on. There are four cities to explore, judging by the map of RAMA's interior provided with the documentation. They are identified by your co-workers as Moscow, London, Paris, and New York. Good luck with your explorations. The graphics that appear with many of your location changes are both colorful and uninformative. It isn't likely that you'll make any startling discoveries by studying them. They do help provide a visual clue as to where you are though.

There is a time limit imposed by RAMA's passage through the solar system. You must complete your explorations and get out in time to meet a fuel freighter or you won't be able to get back to Earth. This may mean you need to develop some other means of transportation besides walking.

There are a few disadvantages associated with a couple of advantages. RAMA has two arcade segments. In the first, you must land your craft on the surface of RAMA. In the second, you must fly a one-man glider inside RAMA. Both of these may be practiced in advance, but the practice is limited and requires changing disks several times in order to do so. For each practice run, you get five tries before you are returned to the last point you occupied in RAMA. This process of going back to where you were can take a couple of disk swaps. To actually get good at playing the arcade games, you'd spend about two hours just flipping disks. But then, how many adventure games have arcade scenes thrown in.

Also, if you use the fly command without preparing properly the computer may lock up. I succeeded in locking the game up several times (always accidently, of course). If I hadn't recently done saves, I'd have been quite angry about it.

RAMA is designed after a book by one of the all time great science fiction authors, Arthur C. Clarke. If the name seems only vaguely familiar, he wrote 2001: A Space Odyssey and its sequel. He has won more SF awards than most other writers.

The people who put this program together seem to have done a good job in maintaining the tone of the RAMA novel. Although I read the book years ago, sufficient time has elapsed that I could enjoy the game without remembering what comes next, so to speak.

I think RAMA is well worth the price. Besides being developed from an excellent book, the package has hours of entertaining puzzles to solve. This is not a game for inexperienced adventurers, however. Although they may enjoy it, new adventurers would be better advised to get familiar with this type of game first. Then dig into this one with a fury.

For those who have enjoyed InfoCom's games, this adventure will probably not be a letdown. Give it a try.

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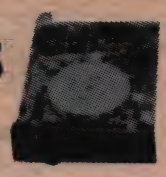

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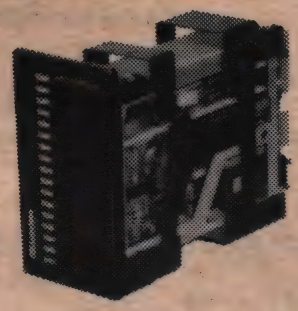

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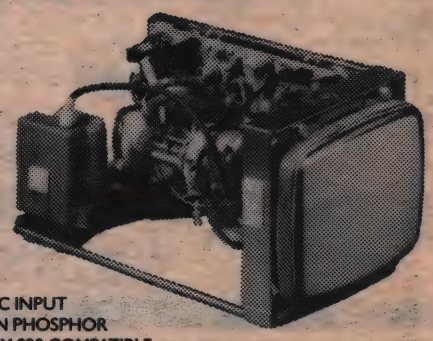

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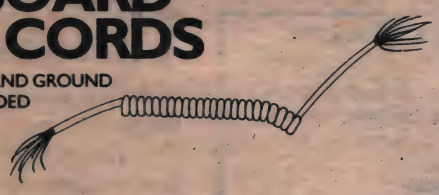

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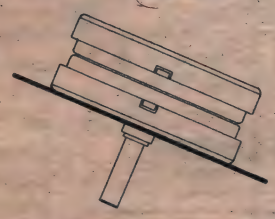

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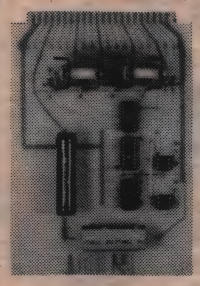

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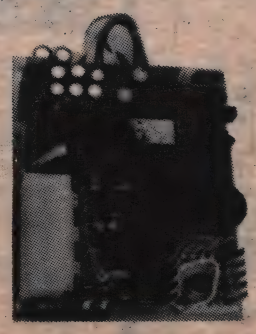

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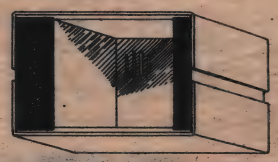

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Inside the VIC-20
Continued from page 148

(upper case) text from Commodore BASIC (or any other language that uses the KERNAL properly). You can "OPEN 4,4" to send output to the printer with "CMD 4" or "PRINT#4."

You also can control a Centronics printer from BASIC using the "CHR$" function and, with a little programming, take advantage of all the features (set double strike, graphics, etc.) it may have. If you want to get the Assembler source code, you can modify it to do a lot more (which we'll discuss later).

You can, if you want, also keep your Commodore printer connected, and change the device number of either the Centronics printer (a simple POKE) or the Commodore printer (usually a switch). Then you can freely switch the output from one printer to the other Lut using different file and device numbers.

Here's what the program doesn't do (yet):

It doesn't translate Commodore graphic characters to foreign (i.e. non-Commodore) printers. It could easily do that with a little more programming, but it doesn't do it yet. That means if you have Commodore graphics in your BASIC listings and then LIST them out using this program, you are liable to get all kinds of weird garbage, characters, lines, etc., showing up in your listing.

To prevent this, change all statements that use graphics characters into "CHR$(x)" statements. That is, use "CHR$(147)" instead of "Shift/CLR-HOME (reverse heart appears on screen)." This is a pain, but for now, it is the only way to circumvent junk appearing in the listing.

It also doesn't automatically adjust to print upper and lower case characters. Generally, you are limited to the ASCII subset that is between decimal 32 and 94 ($20 - 5E). That's over 60 characters and is plenty for a lot of applications. To get to characters outside this range, you must use the "CHR$(x)" function. This means instead of using a command like:

PRINT#4,"Hello"

You must use:

PRINT#4,"H"CHR$(101)CHR$(108)CHR$(108)CHR$(111)

Sounds like lots of fun, right? Well, don't quit reading yet. A little programming can fix everything, so there's hope, for you "upper/lower case" users.

How to Use the Program

Before you can use the program, you must first build the Centronics/User Port interface that we presented in the March issue. The driver is useless without the interface.

Once you've got the interface, type in the BASIC loader program from this issue. This program supercedes all previous printer drivers that we've published, so do us a favor and erase any old copies you may have and we'll both forget anything else ever existed (fair enough?).

RUN the BASIC program and make sure that no errors have occurred. I wrote the BASIC so that the DATA statements are in "BLOCKs." When you run the program, a checksum is calculated on each "BLOCK." Errors will be flagged by the "BLOCK" block number and this will give you some idea as to where in the DATA statements you should start looking.

Once you have the program typed in correctly, make sure you SAVE it! If you try to RUN the program and it has any "hidden" errors, it could easily "bomb" everything and you'll lose all typing you've done and haven't saved. At least you were warned!

Once the RUN is successful, the BASIC program will POKE a fairly short (535 bytes) ML program into the RAM buffer at $C000 - C217. This is the actual printer driver.

If you need to relocate the driver program, you will have to get the Assembler source and re-assemble it. Sometime in the future, I hope to have an auto-relocating version that will "hide" the driver at the high

Continued on page 154

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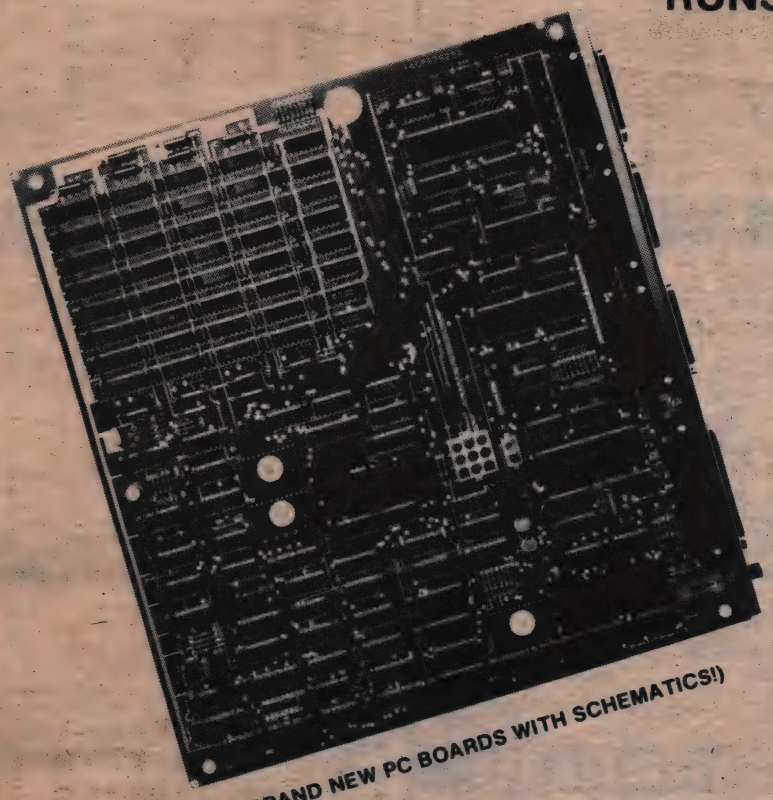

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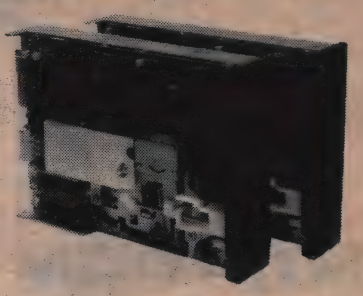

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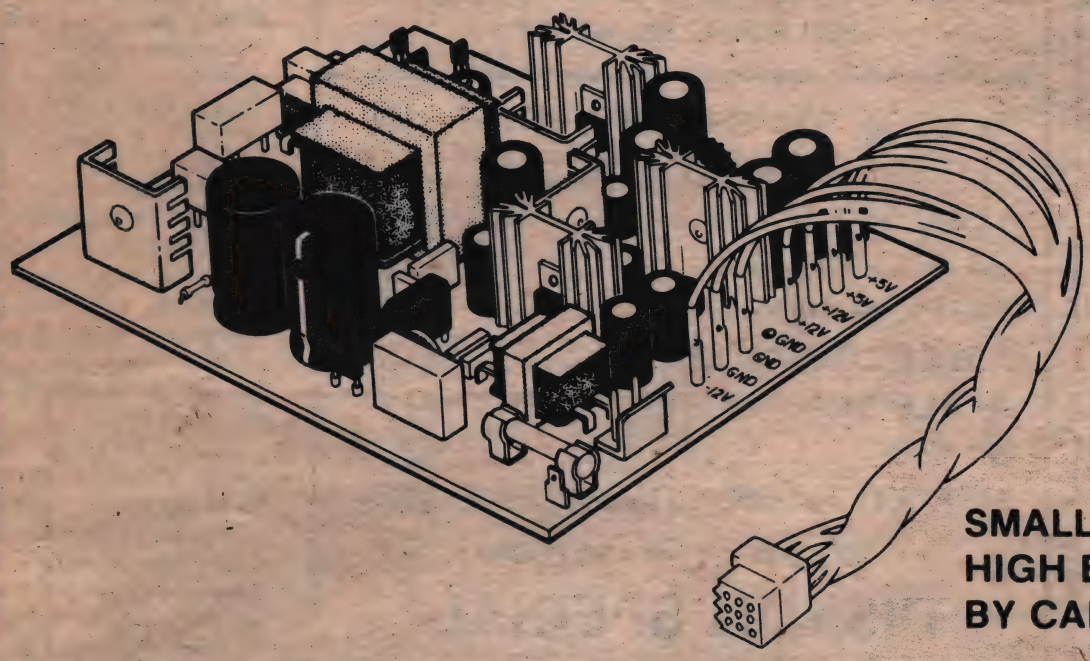

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Inside the VIC-20
Continued from page 150

end of BASIC RAM. For simple BASIC, $C000 is fine.

After the ML program is in RAM, you must then "SYS" to it in order to initialize the driver. This is a simple "SYS 49152." You may then "NEW" and erase the BASIC program from memory (make sure it is SAVED first, though!).

After the "SYS," you may then OPEN your Centronics printer as device #4. For example: "OPEN 4,4,0". You may then "CMD 4" or "PRINT#4" to get output to the printer, just as you would with the Commodore printer.

If your printer is printing everything on one line, it needs extra line feeds (LFs) added to its carriage returns (CRs). There are two ways to do this. First, you can OPEN the printer file with a file # greater than 127 (e.g. "OPEN 128,4"). This will add an LF to every CR automatically. Or, you may OPEN the printer with a Secondary Address of 1. (e.g. "OPEN 4,4,1"). The first method is handled by the KERNAL ROM. The second is supported by the printer driver. Either way works fine.

If you want to switch the printer driver to another device number, just POKE 49577 with the new device number you want to switch to. For example, after "SYS 49152" do a "POKE 49577, 5". This will set up the printer driver as device # 5 instead of # 4.

When CLOSEing the printer driver, you must do it the same way as the Commodore printer. First, do a "PRINT#" to clear the printer buffer out. Then, do a "CLOSE4" or whatever to CLOSE the printer. If you fail to do this the printer may "hang" when you try to "CMD" or "PRINT#" to it again.

If the printer "hangs up," cycling the print "on-line" or "select" button seems to clear things out. You may lose any text that was in the internal buffer, though, so make sure you "PRINT#" before you CLOSE. Consult your Commodore manuals for more basic information on using OPEN, CMD, PRINT#, and CLOSE.

Quiting and Re-Initializing

If you hit "RUN-STOP/Restore" (do a warm reset), you'll find the printer driver is disconnected (even though any files that you OPENed are still OPEN). To totally disconnect the printer driver, CLOSE the printer first and then do a warm reset.

If you want to reconnect the printer driver to the KERNAL, and it's still intact at $C000, a simple "SYS 49152" will reconnect it. If something has erased or otherwise destroyed part of the driver program, you will have to reLOAD and RUN the BASIC loader. Normally, however, this isn't required.

How It Works

I originally wrote this program, not so much as a replacement for the expensive serial bus interfaces, but as an exercise in how to write a new device driver for the KERNAL operating system. Believe it or not, Commodore went to great lengths to make it easy to add new device drivers into the KERNAL, yet almost no one knows how to do it or follows the proper procedure. This printer driver was to be a "model" of sorts that illustrated the proper techniques.

Although we aren't printing the full assembler source code, I will be showing you the parts of the program that demonstrate how the replacement device driver works, so you can understand how to write your own device drivers, too. If you are interested in all the details, get the assembler source and study it. It will give you the "big picture" of how it all works.

Next time we'll be looking at the individual I/O routines. We'll see how we can use OPEN and CHROUT to add some new features onto our "plain vanilla" driver program.

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Addr.: Pro-Line Software, 755 The Queensway East, Unit 8, Mississauga, Ontario L4Y 4C5, Canada, 416-273-6350.
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Product: 1541 Super ROM
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Continued on page 162

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PC-DESK is designed for the IBM-PC and all IBM Compatibles with 64K memory, a disk drive, a printer, and optionally, a modem. It requires DOS 2.0 or higher.

With PC-DESK, one can maintain a comprehensive mailing list database with two search fields and four sort fields. Each record can be annotated with private remarks. Automatic letters can be printed, individually or in groups. The program merges the name, address, date, and salutation with the text of the letter also merging up to four variables within the body of the letter also merging up to four variables within the body of the letter, including the individual's name, his company name, an expiration date, and a "free variable" — which can be anything designated by the user. At the option of the user, PC-DESK will even print centered, emphasized letterhead with each letter.

Envelopes, labels, and repetitive stickers can also be printed automatically.

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Records may be sorted by Zip Code, Record Number, alphabetically by company, or alphabetically by name. A convenient Telephone Directory can be easily printed from all records with a telephone number.

PC-DESK has an integrated,

Continued on page 158

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M	F	U	D	U	D	F	F	F	W	W	H	R
Y	U	A	E	A	S	T	T	I	N	C	C	P
B	T	O	M	H	V	J	L	W	E	A	N	K
A	S	W	S	A	T	L	S	T	A	T	A	R
B	O	D	D	F	E	E	I	P	J	R	F	O
Y	R	I	U	W	Y	T	M	T	G	Y	E	W
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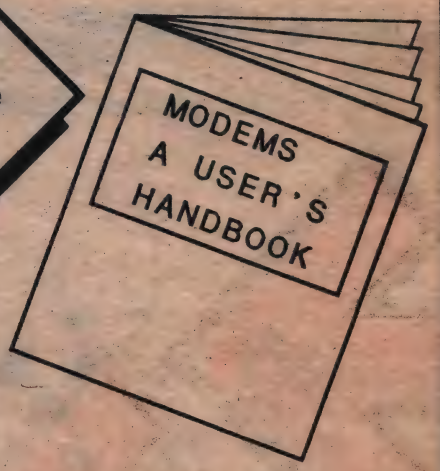

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IEM Introduces
Continued from page 44

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Alpert sees particular potential for this library of routines in such areas as business graphics (Visi-Calc types of applications), medical diagnostics, engineering graphics and general CAD/CAE. Dramatic results are often realized by linking the PLOT 77 subroutines with existing programs for visual (often immediate) display of results.

PLOT 77 comes complete with a user's manual and choice of media; 3½", 5¼" and 8" discs. The price is $395.00 for quantity of one (in U.S. dollars).

For additional pricing, multiple-quantity discounts and delivery information, contact the IEM sales office at P.O. Box 1889, Fort Collins, CO 80522, or call 1-800-321--4671 or (303) 223-6071.

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PC-DESK
Continued from page 156

full function, printing calculator with double precision operation up to one trillion. It has a screen-displayed memory, nine decimal place settings, and will print all transactions on screen or printer.

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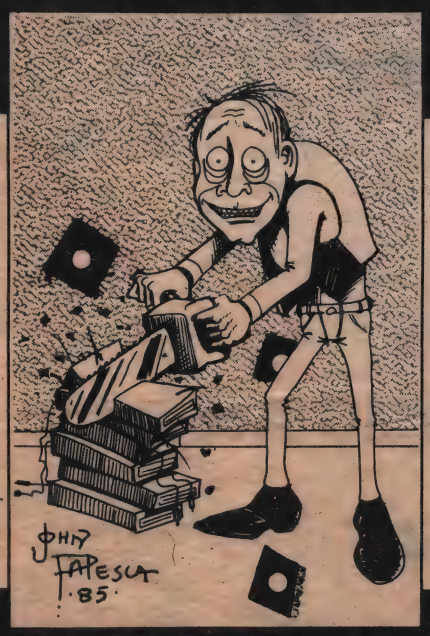

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First GEM
Continued from page 38

GEM applications.

GEM Collection

For those wishing to try out a range of GEM applications, Digital Research offers the GEM Collection. The GEM Collection includes GEM Desktop, GEM Paint, an on-screen graphics design tool, and GEM Write, a full-function word processor. In addition to offering typical word processing features, GEM Write incorporates the GEM-style interface and the ability to merge graphics from GEM Draw, Paint, Graph and Wordchart into written reports.

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GEM Draw, GEM Wordchart and GEM Graph make up a complete presentation graphics series. Each takes full advantage of the ease-of-use features of GEM software — icons, windows, drop-down menus and mouse support. All three produce output limited in quality only by the resolution of the printer or other production device used.

GEM Draw is a sophisticated graphics editor that can produce organizational charts, flow charts, company logos and other pictorials. The program includes a library of predesigned graphics for incorporation by users into their own work. In addition, GEM Draw can be used to edit and add to graphics and charts produced by GEM Graph and GEM Wordchart.

GEM Wordchart produces high-quality text charts, which make up an estimated 40 to 70 percent of all the visuals used in making presentations. The program boasts output quality superior to that of word charts made with a typewriter. In

Continued on page 160

Can You Name Every Dual-Drive Color PC That Runs Lotus 1,2,3 and Costs Under $1500?

Hints

- It comes with a 14" RGB monitor much like the 14" monitor that comes with the $2495 Leading Edge PC.

- It has dual 800K disk drives much like the $2495 Tandy 2000, but unlike the 2000 it will also read and write to 160K, 320K, and 360K IBM-PC formats.

- It's an 8088, MS-DOS system with 256K of RAM, but it comes with a better free software bundle than the 8-bit Kaypro including MS-DOS 2.11, HAGEN-DOS, DOS-TUTOR, WordStar 3.3, EasyWriter, Spell, Mail Track, PC File III, FILEBASE, CalcStar, games, graphics, utilities, and two BASIC languages.

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PC-WRITER

Continued from page 69

enhancement, OK-WRITER, also made for the Okidata (see the January, 1985 Computer Shopper). PC-WRITER achieves this compatibility and also adds several additional functions beyond those offered by the IBM Graphics Printer, including near letter quality printing.

PC-WRITER is a small printed circuit board which plugs into the controller board of the Oki. You need only a screw driver and about five minutes of time while reading illustrated instructions to install it in place. The PC board contains several EPROMS which reprogram the Oki to respond like the IBM Graphics Printer. In fact it's a little like putting the brain of an Epson into the brawny body of the Oki. (The best of both... how can that be?)

The transformation is quite thorough. The Oki responds to all the codes meant for the Graphics Printer, this includes 226 character and symbol codes (many unique to the PC). Bit graphics are also enabled in 3 different densities. The very first test I performed after installing the upgrade was a graphics screen dump from the PC jr. It was perfect, a most impressive demonstration. Besides the PC graphics compatibility, this upgrade adds several other useful functions to the Oki 82a. Included are a 12 cpi elite mode, bold printing, super and subscripting, underlining, reverse paper feed and a special ½ height "squished" set of characters. One of the most convenient new features is the ability to program many of the functions directly from the front control panel. This is aided by the ability of the converted printer to print out a status of its current settings. The folks at Rainbow Technologies were also clever enough to include a mode that allows the printer to display the hex code which it is receiving. This is helpful in isolating printer problems between software and hardware.

One of the premier features of the PC-WRITER upgrade is its ability to create near letter quality printing with the 82a. This is accomplished like many of the more expensive dot matrix printers by making a second pass over the characters, offset slightly from the first. In this mode a 23X17 dot matrix is achieved. The result is very well formed characters, at a sacrifice in speed. Near letter quality is printed at 30 cps, about the same speed as an expensive daisy wheel printer.

Another notable feature of this upgrade is the retention of the choice between serial or parallel communication to the printer. This is important in configuring a system such as the IBM PC or PCjr because this may eliminate or at least minimize the need to purchase extra cables or printer cards and adapters. It can save a significant amount of money.

I would like to mention that possible applications for PC-WRITER extend beyond the PC machine family. As an example I discovered that the PC-WRITER interfaces well with the Tandy Color Computer and allows users of the very popular Telewriter 64 wordprocessor to configure it like an Epson printer. This allows easy access to underlining, super and subscripting (in near letter mode!) with software designed primarily for this printer. There may be other uses of PC-WRITER enabled by the similarity between the IBM Graphics Printer and the Epson line.

The PC-WRITER has few, if any, faults. Since it is based on a dot matrix printer, it does share a common noise problem. In fact, it takes the monotone buzz of the normal 82a and creates a chorus of new sound when it shifts into some of its new printing modes. Even this is used to advantage by Rainbow Technologies creating a "pseudo" Bell quick succession. In direct comparison to the IBM Graphics Printer, and others, PC-WRITER does not include an Italics character set. I personally could care less but some people must use it or it would not be such a popular feature on printers. (Would it?)

The instruction manual and quick reference card get good marks for completness but they do assume a working knowledge of programming control codes. Perhaps this could be beefed up with a few more examples for the beginner, but it should be recognized that it is not really their job to teach computerization to the neophite.

The bottom line of this review is that I believe PC-WRITER is a valuable upgrade available for the Oki 82a. No need to sell the old Oki at your next garage sale. With the PC-WRITER implanted into the Oki, you have the multifunction capability of draft text, near letter text and graphics in a heavy duty printer. All this integrated in a package that is truly compatible with the IBM PC and PC jr. I have only skimmed over the major features of this product. If this review has sparked an interest you should write the manufacturer.

PC-WRITER retails for $149 and is available from Rainbow Technologies, 17971-E Sky Park Circle, Irvine, CA, 92714

First GEM

Continued from page 158

fact, GEM Wordchart is as easy to use as a typewriter with an "orator" ball, yet it produces wordcharts that rival those made by commercial artists at many times the cost.

GEM Graph is designed specifically for the clear communication of data, rather than just data analysis. Simply by selecting well-designed templates from a gallery of graph styles, users without extensive design skills can produce professional-quality graphics quickly.

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Price and Availability

GEM Desktop and GEM Draw was avilable from both Digital Research and computer retailers mid-April. GEM Draw is offered at an introductory price of $149 until August 31, after which it will have a suggested retail price of $249. GEM Desktop is offered for $49.95. GEM Desktop comes with a coupon, good until August 31, allowing the holder to obtain the other two components of the GEM Collection at a reduced price.

GEM Collection is due to be released in mid-June. The suggested retail price of the complete GEM Collection is $199. Early purchasers of GEM Desktop may purchase the remainder of the GEM Collection, GEM Write and GEM Paint, for $99.95 until August 31 with the coupon enclosed in the GEM Desktop package.

For further information contact Digital Research, Box DRI, Monterey, CA 93942.

Mention that you read about it in Computer Shopper. ●

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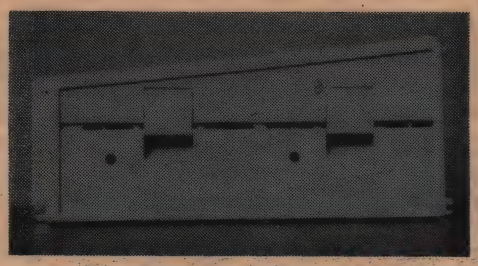

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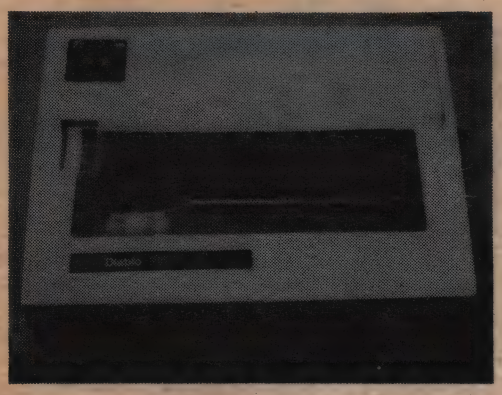

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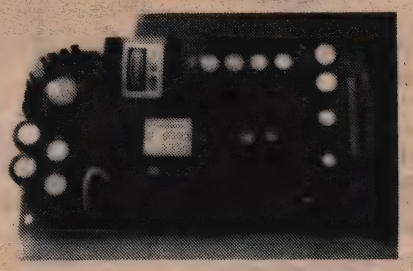

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Inside the VIC-20
Continued from page 154

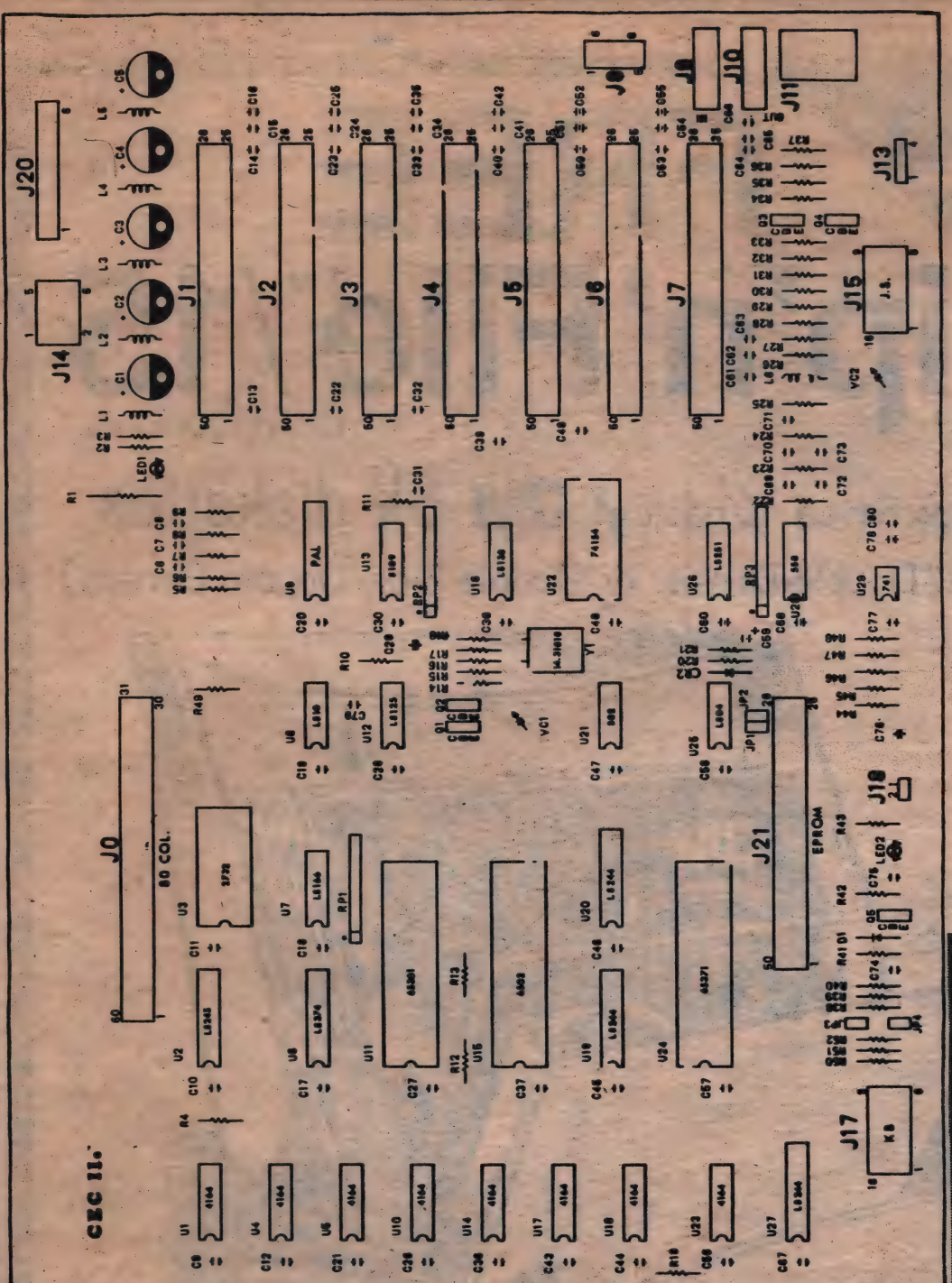
Price: $39.95 plus $2.00 shipping and handling.

Product: DiscoPlexor II
Addr.: Warren Radio, 800 S.W. Jefferson, Peoria, IL 61605, 309-673-5998.
Price: $99.95 plus shipping.

Product: The Transactor Magazine - May '85.
Addr.: Transactor, 277 Linwood Ave., Buffalo, NY 14209-9990.
Price: $4.50 includes postage.

```
100 REM CENTRONICS PRINTER DRIVER
110 :
120 REM VERSION 2.0
130 :
140 REM COPYRIGHT (C) 1984, 1985 BY
150 :
160 REM TED DRUDE
170 :
180 REM ALL RIGHTS RESERVED
190 :
200 PRINT CHR$(147)
210 PRINT:PRINT:PRINT
220 PRINT " LOADING THE DRIVER INTO RAM AT $C000..."
240 GOSUB 900
250 PRINT "    IF SUCESSFULLY LOADED, ENABLE WITH "
260 PRINT
270 PRINT "          'SYS 12*4096'."
280 PRINT
290 PRINT "    OPEN PRINTER WITH SECOND ADDRESS "
300 PRINT "     OF '1' FOR EXTRA LINEFEED."
310 PRINT
320 PRINT "         (E.G. 'OPEN 4,4,1') "
500 END
890 REM LOAD THE CENTRONICS DRIVER
899 :
900 REM BLOCK # 1
901 FOR LOC= 49152 TO 49290 :READ DA: POKE LOC,DA: CK=CK+DA: NEXT LOC
910 IF CK <> 17217 THEN PRINT "ERROR IN BLOCK # 1"
912 CK=0
914 :
920 REM BLOCK # 2
921 FOR LOC= 49291 TO 49428 : READ DA: POKE LOC,DA: CK=CK+DA: NEXT LOC
930 IF CK <> 17155 THEN PRINT "ERROR IN BLOCK # 2"
932 CK=0
934 :
940 REM BLOCK # 3
941 FOR LOC= 49429 TO 49555 : READ DA: POKE LOC,DA: CK=CK+DA: NEXT LOC
950 IF CK <> 17024 THEN PRINT "ERROR IN BLOCK # 3"
952 CK=0
954 :
960 REM BLOCK # 4
961 FOR LOC= 49556 TO 49687 : READ DA: POKE LOC,DA: CK=CK+DA: NEXT LOC
970 IF CK <> 11540 THEN PRINT "ERROR IN BLOCK # 4"
980 :
990 RETURN
1000 :
1004 REM DATA STATEMENTS
1006 :
1008 REM BLOCK #1
1009 :
1010 DATA 162,247,160,193,56,32,141,255
1020 DATA 173,170,193,208,40,169,255,141
1030 DATA 170,193,162,17,189,253,193,157
1040 DATA 91,192,202,16,247,173,11,194
1050 DATA 174,12,194,141,87,192,142,88
1060 DATA 192,173,5,194,174,6,194,141
1070 DATA 81,192,142,82,192,162,17,189
1080 DATA 73,192,157,253,193,202,16,247
1090 DATA 162,247,160,193,24,32,141,255
1100 DATA 96,109,192,197,192,247,192,19
1110 DATA 193,0,0,46,193,61,193,0,0,153
1120 DATA 193,0,0,0,0,0,0,0,0,0,0,0,0
1130 DATA 0,0,0,0,0,0,165,184,208,5,169
1140 DATA 6,76,204,193,165,186,205,169
1150 DATA 193,240,3,108,91,192,166,184
1160 DATA 32,172,193,208,5,169,2,76,204
1163 :
1165 REM BLOCK # 2
1167 :
1170 DATA 193,166,152,224,10,144,5,169
1180 DATA 1,76,204,193,230,152,157,89
1190 DATA 2,165,185,141,168,193,157,109
1200 DATA 2,165,186,157,99,2,169,255,141
1210 DATA 3,221,173,0,221,9,4,141,0,221
1220 DATA 173,2,221,9,4,141,2,221,169
1230 DATA 16,141,13,221,24,96,32,177,193
1240 DATA 240,2,24,96,32,188,193,165,186
1250 DATA 205,169,193,240,5,165,184,108
1260 DATA 93,192,198,152,228,152,240,20
1270 DATA 164,152,185,99,2,157,99,2,185
1280 DATA 109,2,157,109,2,185,89,2,157
1290 DATA 89,2,24,96,32,172,193,240,5
1300 DATA 169,3,76,204,193,32,188,193
1310 DATA 165,186,205,169,193,240,3,108
1320 DATA 95,192,169,6,76,204,193,32,172
1323 :
1325 REM BLOCK # 3
1327 :
1330 DATA 193,240,5,169,3,76,204,193,32
1340 DATA 188,193,165,186,205,169,193
1350 DATA 240,3,108,97,192,133,154,24
1360 DATA 96,165,153,205,169,193,240,3
1370 DATA 108,101,192,169,6,76,204,193
1380 DATA 141,171,193,165,154,205,169
1390 DATA 193,240,6,173,171,193,108,103
1400 DATA 192,138,72,152,72,173,168,193
1410 DATA 208,9,173,171,193,32,124,193
1420 DATA 76,115,193,201,1,173,171,193
1430 DATA 32,124,193,201,13,240,3,76
1440 DATA 115,193,169,10,32,124,193,104
1450 DATA 168,104,170,173,171,193,24
1460 DATA 96,72,173,13,221,41,16,240
1470 DATA 249,104,141,1,221,173,0,221
1480 DATA 41,251,141,0,221,9,4,141,0
1483 :
1485 REM BLOCK # 4
1487 :
1490 DATA 221,173,1,221,96,165,153,205
1500 DATA 169,193,240,3,108,107,192,169
1510 DATA 6,76,204,193,0,4,0,0,169,0
1520 DATA 133,144,138,166,152,202,48
1530 DATA 5,221,89,2,208,248,96,189,89
1540 DATA 2,133,184,189,99,2,133,186
1550 DATA 189,109,2,133,185,96,72,32
1560 DATA 204,255,160,0,36,157,80,18
1570 DATA 185,235,193,32,210,255,200
1580 DATA 201,12,208,245,104,72,9,48
1590 DATA 32,210,255,104,56,96,73,47
1600 DATA 79,32,69,82,82,79,82,32,35
1610 DATA 32,0,0,0,0,0,0,0,0,0,0,0,0
1620 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,0
1630 DATA 0,0,0,0,0,0,0

READY.
```



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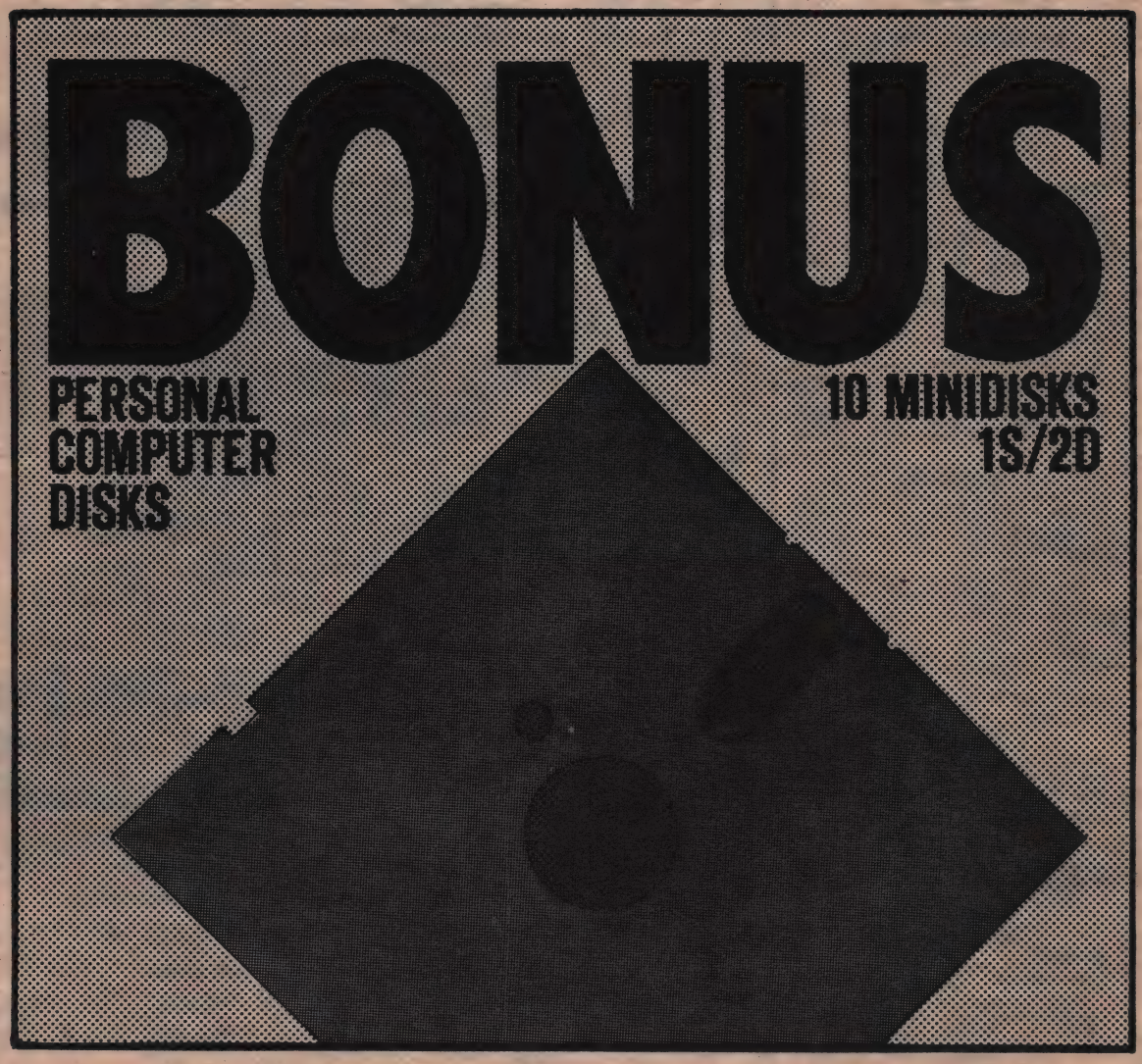

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Stan Veit's History
Continued from page 78

and in 1979 they went into bankruptcy declaring Chapter 11 and attempted a reorganization. This did not work and the company was disolved and its assets were sold.

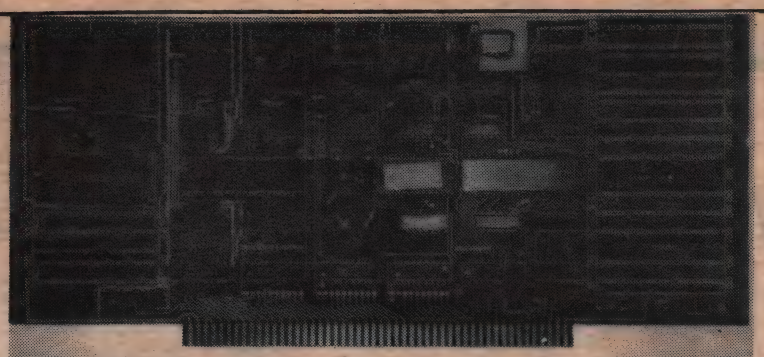
From that time on my knowledge of digital group is very dim. However, a large group of loyal users remain and at least two companies have carried on the system and the legend forged by Dr. Suding and digital group.

To relate the tale of what happened after the fall I am presenting the following letter from Rex Widmer who is part of the continuing story.

R.W. SALES
5024 Halsey
Shawnee, KS 66216
(913) 631-1057

Dear Stan:

I note with interest the listing for "What Ever Happened to Digital Group" in the THINGS TO COME section of the April '85 Computer Shopper.



THE RWS Z-80+ CPU CARD

Your experiences with DG probably cover the period during the early days. I seem to recall an earlier article in which you covered some of those hectic days. I hope the following items may help fill in the details since the demise of the Digital Group.

Digital Group originally filed for Chapter 11 protection from creditors and reorganization in early 1979, citing the usual cash flow, etc problems. They continued to operate under Chapter 11 and court supervision until the reorganization plan was rejected by the creditors committee in August 1979. One single creditor (Hamilton/Avnet as I recall) held over 50% and their thumbs down was doom for DG.

After and as a result of the rejection of the creditors plan, DG filed for liquidation. Despite some interest, the trustee of the estate did not attempt to sell the company as a whole, but rather placed the remaining assets on the block for auction. The auction was held in October 1979, with only very limited notice to interested parties.

Over 200 parties attended the sale. A few surplus dealers were there, primarily interested in big lots of general purpose parts. At least 3 parties were interested in commercial quantities of boards, photo masters, etc. The remainder of the bidders were a large group of users — both individuals, and group buyers representing even more users in the field.

The assets and inventory of the company were widely dissipated in the sale. The sale of the computer oriented portion of the estate was a 10 hour exercise, with many hundred lots of goods being sold. Many users purchased product, bare boards, and parts, working or not, to protect their investments. The surplus dealers bought up most of the loose components. The remaining assets — designs, some bare boards, sheet metal, etc. was split among the commercial buyers, my firm included.

Unfortunately, many of the tangible assets of DG were not properly protected by the trustee of the estate. Board copyrights were not enforced. Master and working films were not retreived from PC job shops. Court orders prohibiting use of these assets were not obtained. Rights of first refusal to retreive significant amounts of finished product still at fabricators were not enforced. The net result was that some of the purchasers of design rights found that bootleg boards of the most saleable items (the dual density disk controller and motherboard) were being produced by parties which had not

Continued on page 168

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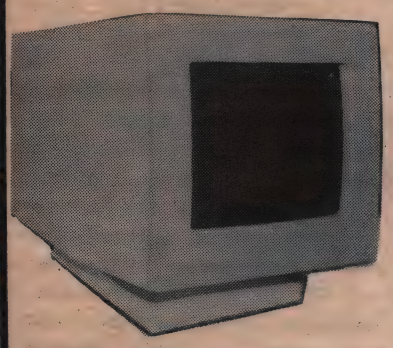

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Monitor is capable of Ultra High Resolution Graphics

25 MHZ Band Width
Swivel Base
IBM * Compatible

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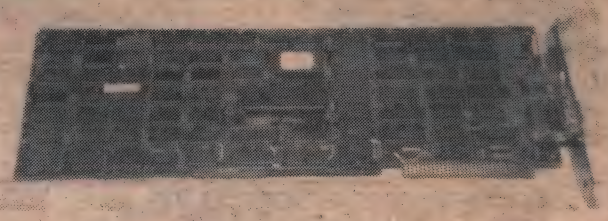

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$119 EA.

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Separate Horizontal & Vertical Sink 110VAC

30 MHZ Band Width — **$80** ea. green

IBM* Compatible — **$80** ea. amber

Add $50.00 for cabinet/swivel base)

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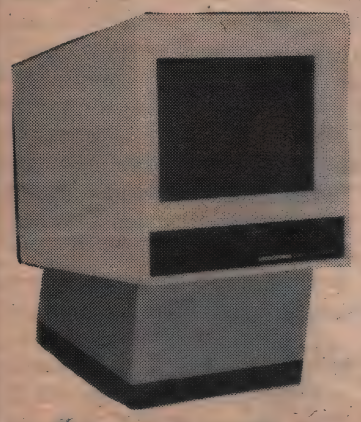

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Black & White
Composite Video =
110V (Used Good Condition)

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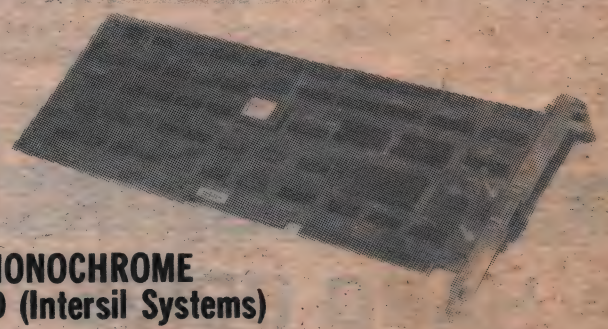

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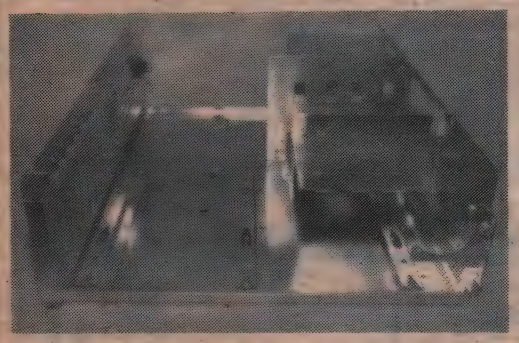

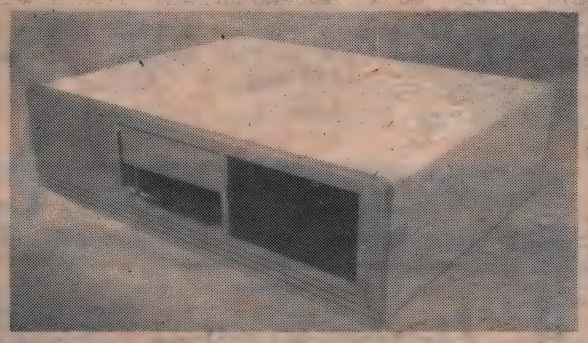

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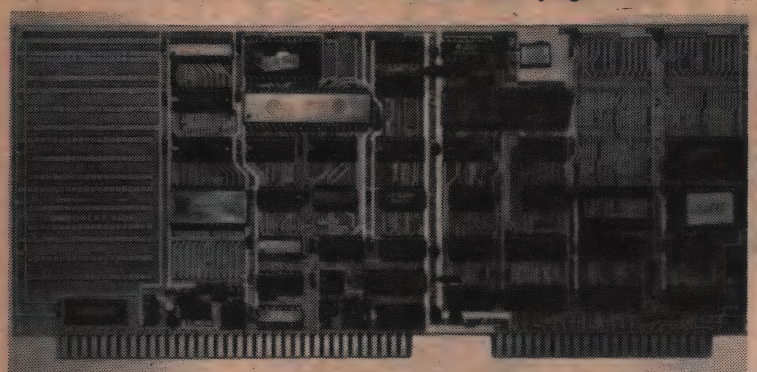
Stan Veit's History Continued from page 166



THE RWS TV80 VIDEO GENERATOR/ KEYBOARD INTERFACE CARD

purchased the designs.

The only intangible which was protected and later sold was the customer list — such as it was. Since many DG machines were sold by dealers, and no warranty cards were used, the records of where the 3,000 or so systems were. This was purchased jointly by the various commercial interests at the sale.

Since that liquidation was over 5 years ago, you might think that nothing is left of the Digital Group and their systems. Not true. At the time of the failure (1979), only 2 second sources existed for Digital Group (Suding Bus) boards. VLSI Systems in Los Angeles and Godbout in Oakland both produced 32K static memory boards of a far cleaner layout than the DG equivalents. We produced some accessory items, but nothing approaching a full board level product.

At the present time, over five years later, the systems are still fully supported. Two manufacturers, ourselves, and AEON Electronics, Inc. (Denver, CO) still support the system. During the interim several other manufacturers have built board level products for the Suding Bus systems. At least 10 major all new board level products have been built to support the Suding Bus by 3 manufacturers. While all of these firms are real "small business" concerns, they have survived the test of time, and continue to offer product and support to the users.

Digital Group System Boards

Dr. Suding's original design concepts have stood the test of time. First rate power supplies and cabinets (once DG delivered them) are still in service, even for systems delivered in 1977. The very early migration from 8080 to Z-80 as the primary CPU chip (while maintaining the ability to use 6502, 6800 and 8080 with a processor card swap) has kept the system in the mainstream of the 8 bit world. While the PHI DECKS which gained popularity in 1977 or so have hit the junk heap, the presence of the original Suding format Audio system has provided the system owner with access to an excellent set of diagnostics which did not depend upon the system being fully operational. The ability to update the system a card at a time has provided growth thru the addition of disks, then double density disks, upgrading the 64x16 displays to 80x24, addition of intelligent I/O, hard disks, Pseudo Disks, large bank switched memories, etc., etc.

While DG did not promote the use of standard software, CP/M, MP/M, and OASIS-8 all operate on the system. Slightly late to save DG, but in time to make the systems very usable for the system owners.

The DG users are also a resiliant lot. A fully independent newsletter "Bridge" Bi-directional Reflections for the Illumination of Digital Group Enthusiasts has survived since before the big B(ankruptcy) day. Two editors have spearheaded the effort, with the current one being Reggie Gates (4244 Carfax, Lakewood, CA 90713). The first — Lloyd Kischinsky is now a principle of Micro Mint, Inc. (the builder of many Steve Circia projects).

The users seem to survive with their own means. The hams of the group still have a weekly net on Saturday mornings on 20 meters. The general population (and especially the hams) show up for a gathering at the Dayton Hamvention each year. With a typical attendance of 80 to 100. You and your staff, are of course invited to attend, if you will be attending the show. I seem to recall that some of your staff usually was there representing the Computer Shopper. The meeting will be at the Holiday Inn Dayton North, I75 and Wagonner Ford Road, from 7 to ??? on Saturday April 27, 1985.

All in all, not bad for a system originated by a company declared bankrupt and liquidated almost 6 years ago.

Hope this provides some entertainment and information from a particular obscure corner of the industry.

Sincerely,
Rex Widmer — Owner •

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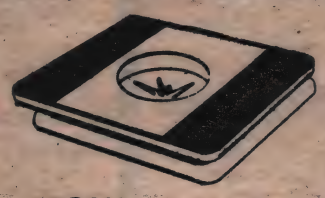

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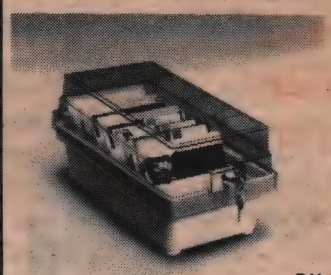

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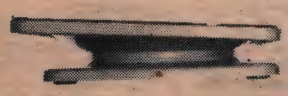

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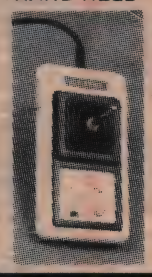

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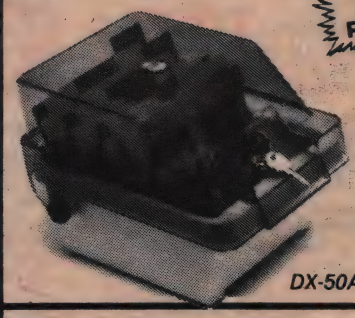

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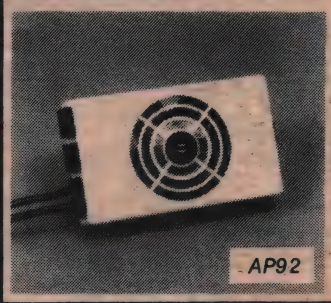

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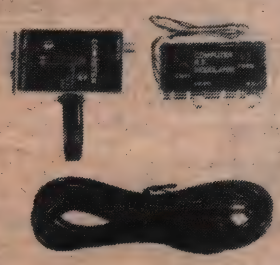

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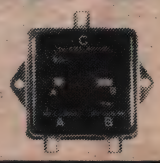

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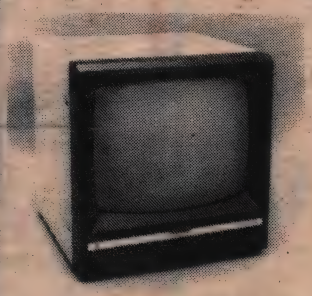

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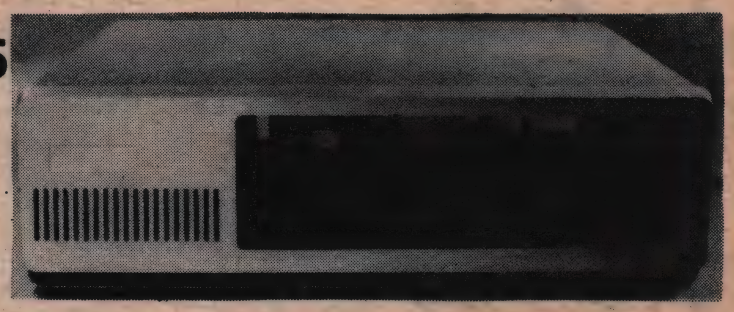

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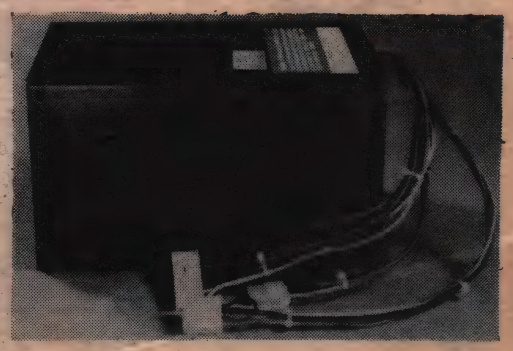

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How Color CRTs Work
Continued from page 20

phosphors down in different patterns, the CRT operation is essentially the same. This discussion will use the old standby--the shadow-mask and color-triad approach to explain CRT operation.

(By the way, if you use a magnifying glass to look at the operating screen of a color-TV receiver, or video color monitor in operation, you will see the color-phosphor triad arrangement, and how they glow to produce the required color. If you do not have a magnifying glass, sprinkle a few drops of water on the screen and look through one of the droplets to see the phosphor action.)

A shadow-mask is essentially a large metal sheet having several hundred thousand small holes, mounted just in front of the phosphor color-triads affixed to the glass faceplate of the CRT. A color-triad is a trio of three color (red, green, blue) phosphor dots just touching each other. Figure 3A shows the relationship between one hole in the metal shadow-mask and its associated three color phosphors (called a "triad"). Note that the metal hole is "aimed" at the junction of the three phosphors.

The relationship between the three electron guns, a single shadow-mask hole, and its associated three phosphor dots is shown in Figure 3B. Note that in the interests of simplicity, the latter illustration shows the phosphor triad as three vertical phosphor dots.

The electron beam from each color gun is passed through the hole in the shadow-mask in such a manner that it is aimed only at its color phosphor. The several hundred thousand holes in the shadow-mask and their associated color triads cover the entire screen area on the interior side of the CRT faceplate. Thus, as each color gun is "modulated" by its pertinent color video signal, its associated color phosphor glows.

For example, if only the red gun is driven, then only the red phosphor will glow producing a red image. If only the green gun is activated, only a green image will be seen, and obviously, if only the blue gun is driven, only a blue image will appear. If each, or all, of the three guns are turned on proportionally, as shown in Fig. 2, a number of colors, including white, can be seen.

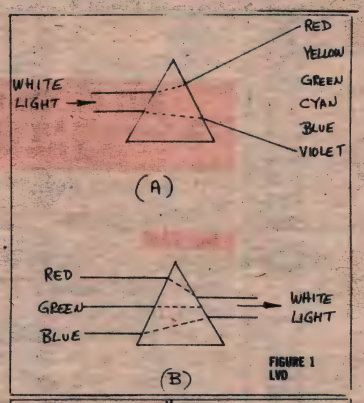
The full explanation of color theory and how all colors can be created is a little too long for this article, so the reader is urged to obtain library books on color-TV and read.

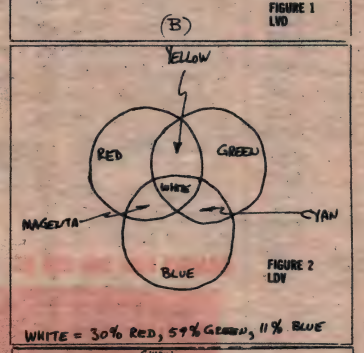
When it comes to creating an image on the entire raster of the color CRT, another problem pops up--a problem called "convergence."

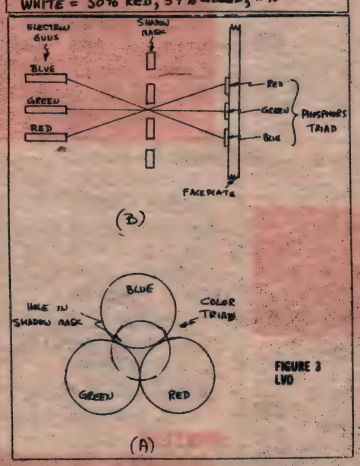
As shown in Figure 4, the three electron beams can be made to "converge" (brought to a fine point) only at the direct center of the CRT screen. Since the phosphor-coated glass faceplate of the CRT is essentially flat, and the locus of the convergence is essentially hemispheric (with the center at the sweep center of the yoke), the three beams go out of convergence (misconvergence) when they leave the approximate center of the screen. This action will produce a clear image at the middle of the screen, and a fuzzy image where the three beams spread out away from the center.

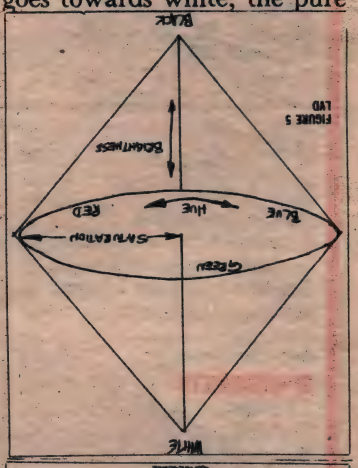
To make proper convergence take place away from the center, a special signal is created within the vertical and horizontal sweep circuits and applied to a small yoke--called the convergence coil--which like the sweep yoke is also mounted on the neck of the CRT. The vertical and horizontal convergence signals cause the three beams to properly converge all over the CRT screen.

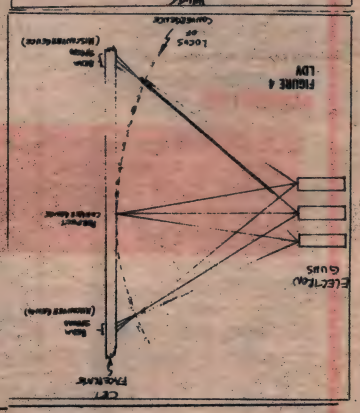
The vertical and horizontal convergence current levels are determined by a set of six (usually color-coded) manually operated potentiometers, usually located behind a safety door on the TV or color monitor. These adjustments should be made only by a knowledgable technician because when wrongly adjusted, they can cause a blurry chromatic image to be seen all over the CRT screen.











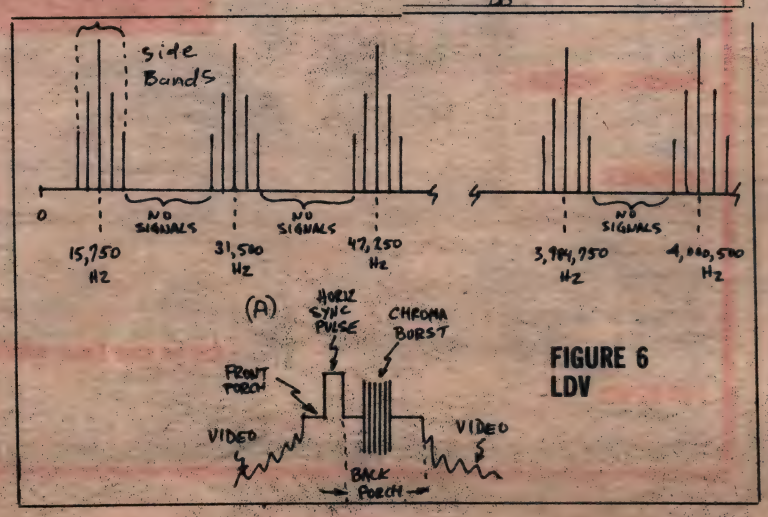


FIGURE 6 LDV

For example, when the red gun is turned on, the point of impact is full red. However, it is possible to turn on the other two guns so that as the resulting combination goes towards white, the pure red is diluted to form pink or any other pastel shade between full red and white.

Note that both hue and saturation are functions of the color elements within the CRT.

The third component, brightness, is actually the total brightness--without color--of each spot on the CRT and ranges between full white and full black. It is this brightness component that allows a color signal to be seen in various shades of gray on a monochrome CRT.

Probably the next question asked is "How do they put the color signal into an already full 4.2 MHz bandwidth signal?"

The answer to this is that the "full 4.2-MHz bandwidth" is not full, and in fact almost half of this bandwidth is devoid of any signals.

Part of the reason for this is shown in Figure 6A. There is a little more to it than what we will discuss, but we are only covering the basics in these articles.

When a black-and-white picture is scanned, the resulting signal distribution clusters around the frame (30 Hz) and the line (15,750 Hz) scanning frequencies. Note that most of the gap between harmonics of the 15,750-Hz line frequency is essentially empty as shown in Figure 6. There are more harmonics than those shown, but their signal power is greatly reduced, so that their effect is negligible.

Engineering tests show that it is possible to "interleave" another set of signals in the empty gap between line scans without each disturbing the other. This other set of signals is the color, or chrominance, signals.

To perform the interleaving, the chrominance carrier is selected to fall on an odd multiple of one-half the line scan. After considerable field testing, it was found that using a chroma subcarrier of 3,579,545 Hz (3.58 MHz for short), which is the 455th harmonic of one-half the line frequency, did the job.

The chroma signals, interleaved with the sync pulses in what is called "composite video", is applied to the input of a color video monitor. To extract the chroma signal from the composite, and make sure that it is in the proper phase, a special 8-cycle color "burst" is inserted on the horizontal sync pulse backporch as shown in Figure 6B.

This burst is gated off the signal by special circuits within the color-TV or color video monitor, and is used to help re-create the same colors that were applied to the original video signal. ●

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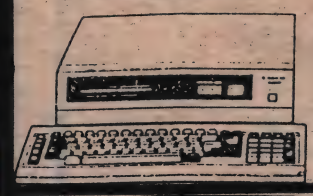

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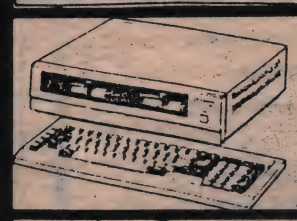

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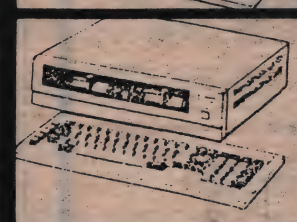

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Understanding Computer Continued from page 20

onscreen image.

The last element, the input video signal, is a composite signal that consists of a mix of horizontal and vertical synchronization (sync) pulses and the picture information (video).

The computer-generated horizontal and vertical sync pulses keep the horizontal and vertical sweep oscillators of the video display "in step." The remaining component of the composite signal is the varying video signal that is applied to the control grid of the CRT to create the picture light and dark components.

As shown in Figure 3, the sawtooth current applied to the horizontal portion of the yoke, causes the electron beam to horizontally scan across the phosphor-coated faceplate of the CRT, starting at the upper left-hand corner of the CRT and proceeding from left to right in almost a straight line, leaving a glowing trail (trace) behind it.

When the scanned line reaches the right side of the CRT, it is very rapidly returned (retraced) to the left side where it instantly starts another left-to-right scan.

To keep from forming just a single-line "raster" at the top of the CRT screen, the electron beam is also simultaneously slowly swept in the downward (vertical) direction by a very slow sawtooth signal applied to the vertical coil of the CRT yoke.

When the trace reaches the bottom of the CRT screen, one field is completed. At this point, the electron beam is then forced to rapidly retrace to the upper left-hand corner of the CRT screen where both the fast horizontal and slow vertical sweep start once again. This continuous sweeping action produces the raster and can be easily seen by taking a close look at the line structure forming the glowing screen of any TV receiver.

As we know, the brightness of any given point along a trace is a function of how many electrons strike the phosphor at any given time. The action of the video signal on the control grid determines the number—hence instantaneous brightness.

Thus, since the two sweeps and the video signal are in "step," the raster displays the video image created by the computer.

Engineering tests made in the early days of TV showed that a horizontal scan rate of approximately 15 kHz with 60 Hz for the vertical will produce a useful raster. Other tests showed that two "interlaced" fields formed from 262.5 lines would each form a 525-line raster, the optimum for viewable needs and that used in conventional TV.

However, most computers use a non-interlaced raster, usually about 260 lines, but the scanning technique is the same as that just described.

If you take a close look at the screen of a monochrome TV receiver, you will easily see the line structure and the varying video that produces the raster-scan TV image. It will be a little more difficult to see this on a color TV.

The insert in Figure 3 also shows the relationship between the horizontal line sync pulse and the video.

Note that the actual sync pulse is "blacker than black" and is not seen on the CRT screen. The sync circuit shown in Figure 2, clips the sync pulse from the composite waveform and uses it to control the sweep circuits.

The video signal is the voltage variations that occur between the horizontal sync pulses. This voltage is amplified and applied to the control grid of the CRT where it "modulates" the brightness along the horizontal trace.

Note that each horizontal sync pulse is preceded and followed by a small segment of black, used to frame the viewed picture. The black portion before the horizontal sync pulse is called the "front porch," and the black element following the horizontal sync pulse is called, appropriately enough, the "back porch." The back porch of a sync pulse is actually the start of the video signal for that line, while the front porch of the next pulse forms the right side frame.

When a color signal is being transmitted, the color "burst" rides on the back porch of each horizontal sync pulse.

Although the vertical sync pulse is not shown in Figure 3, it does occur each 1/30th of a second to reset the vertical sweep to the upper left corner of the CRT display. ●

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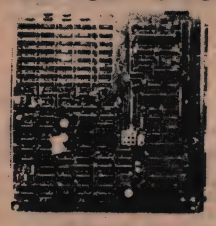

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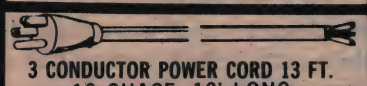

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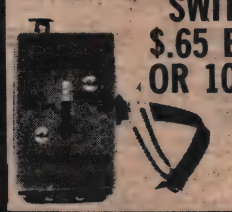

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SPS-80A TESTED SUPPLY $24.50
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TELEPHONE CIRCUIT BOARDS

Complete circuit boards with all components. Includes piezo ringer, microphone & dialer IC.
TCB-80 .....$2.25ea or 10/$12.50

PARALLEL PRINTER CIRCUIT BOARD

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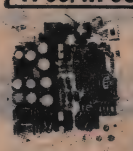
PCB-80 .....$15.00

DT-1 KEYBOARD

Unencoded Keyboard used with the DT-1 Term. Similar to TRS 80 MOD III keyboard.
KBD-1 .....$12.50

TI 99/4A COMPUTER SURPLUS



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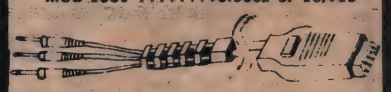

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Dual output: 18vac @ 22va & 7.5vac @ 1va. Heavy duty.
TN-18 .....$2.50ea or 10/$22

New High Resolution
Continued fromm page 10

$698, but is sold for about $479 by mail order or discount stores.

PGS SX-12 High Resolution Monitor

Since the introduction of the IBM PC/XT and compatible computers, the quality of color graphics created by many of the graphics boards has exceeded the ability of monitors to reproduce it. In addition there has been a demand to increase the quality of text on color monitors. PGS has introduced the SR-12 as a response to both needs. The SR-12 has a .31mm dot size with a 690x480 pixel resolution. In non-technical terms the SR-12 is a monitor with high resolution color graphics and excellent text qualities. The SX-12 sells for $799.

PGS Max-12 Monochrome Monitor

When confronted with a fine color display, I used to say "It's nice, but I need good quality text, so I will stick with IBM Monochrome Display." Recently I saw a Max-12 Amber Monochrome Monitor from PGS. I like it better than my IBM Monochrome Display. The Max-12, a 12" Amber monitor with an 18 MHz bandwidth, has a resolution of 720x350 pixels and displays 80 characters by 26 lines. It comes with a cable for the IBM PC and only costs $249.

For information: Princeton Graphics Systems, 1101-I State Road, Princeton, NJ 08540. (609) 683-1660, (800) 221-1490.

Quadram Corporation

Quadram, a company specializing in peripherals for the IBM PC and compatible computers makes many products for graphics and video displays, including monitors.

Note — Quadram is owned by the same company as Princeton Graphics, you may get a Princeton CRT under the Quadram label. There is nothing wrong with that!

Quadchrome I RGB Monitor

Quadchrome I, a 12" RGB monitor, displays 80 characters by 25 lines using an 8x8 matrix of .31mm dots. Displaying color graphics with a resolution of 690x480 pixels, the monitor has 8 colors.

Quadchrome II RGB Color Monitor

The Quadchrome II, a 14" RGB Monitor differing from the Quadchrome I only in CRT size.

Quadram Amberchrome Monochrome Monitor

The Amberchrome, a 12" Amber monochrome, monitor, displays 80 characters by 25 lines with a resolution of 720x350 pixels. It generates 7x8 dot matrix characters and has an anti-glare CRT that produces sharp contrasts between the bright amber background dots and the black character dots thus creating clear characters. The Amberchrome can plug directly into the IBM monochrome card or Quadram's own color adapter for the IBM PC and compatibles.

Quadscreen Monitor

The Quadscreen, a very large and unusual monitor, is a 17" monitor plus a monochrome board for the IBM PC. It displays 160 characters per line instead of the usual 80 characters per line and up to 64 lines. The double width can be divided to show two full pages of text at the same time and the monitor can switch between the two video pages. Quadscreen also displays color graphics with a resolution of 968x512 pixels. The monochrome board provides 128K of RAM memory and up to 16 fonts of type can be displayed on the screen.

For information: Quadram Corporation, 4355 International Blvd., Norcross, GA 30093. (404) 923-6666.

Sakata Model 200 RGB Color Monitor

The Model 200 is a 13" RGB Color monitor designed for use with the IBM PC and compatible computers. Using digital RGB input, it displays 8 colors plus various color intensities for a total of 16 colors. Model 200 has 80 characters by 25 lines of text using a 5x7 matrix with .39mm dots. It also displays color graphics with a resolution of 640x240 pixels.

Sakata Model 300

The Model 300 is similar to the Model 200 except it offers a superior resolution of 730x240 pixels.

For information: Sakata USA Corp., 651 Bonnie Lane, Elk Grove Village, IL 60007. (312) 593-3211.

Sony KX-1211HG RGB Video Monitor

The KX-1211HG, a 12" color monitor, can use either digital or analog RGB video signals displaying 80 characters by 25 lines and providing color graphics with 640x240 pixels resolution. Having the Sony Trinitron gun improves the resolution and there is a built-in stereo amplifier.

Sony CPD-9000 and CPD-1201 Trinitron RGB Monitors

CPD-9000 and CPD-1201 are true computer grade video monitors with the Sony Trinitron gun system. The 9000 is a 9" monitor that offers an 80 character by 25-line display. The 1201 is a 12" monitor that has a 100 character by 25 line display. Both feature RGB analog/TTI color operation and use a .24mm dot for text and graphics giving an unusually sharp picture as well as clear text. For graphics the 9000 has a resolution of 900x240 pixels. The 1201 has a resolution of 640x240 pixels. They are both plug-compatible with the IBM PC.

For information: Sony Corp. of America, Sony Drive, Pound Ridge, NJ 07656. (201) 930-1000 EX 6498.

Taxan Model 210 Composite Color Monitor

Taxan 210, a 12" color monitor, uses a combination of RGB and Composite Video input. Having a bandwidth of 6 MHZ, it can display 64 characters by 25 lines. The Model 210 has a resolution of 380x262 pixels and is compatible with Apple II and Commodore 64 in its composite mode. It can be used in RGB mode with Apple II if a Taxan RGB board is installed in the computer.

Taxan Model 400 RGB Monitor

Model 400, a medium resolution monitor, is used with the IBM PC and compatibles. Having a 15MHz bandwidth and displaying 64 characters by 25 lines, the resolution is 380x262 pixels.

Taxan Models 410/411

Models 410/411 offer higher resolution than Model 400. They can display 80 characters by 25 lines and the resolution is 512x262 pixels. The Model 411 is for IBM PC only and has the ability to switch to a black on green screen for text characters. It is packaged with an IBM PC cable.

Taxan Model 415 RGB Monitor

The Model 415 is similar to the Model 411 except it has a resolution of 640x262 pixels.

Taxan Models 420, 420L and 425 RGB High Resolution Monitors

The Model 420 is the same as the Model 415 except it has audio as well as video. It lists for $650. The Model 420L has a longer persistence tube and the Model 425 has the ability to switch to green color of text processing.

For information: TAxan Corp., 18005 Cortney Court, City of Industry, CA 91748. (818) 810-1291.

Zenith Model ZVM-131 RGB/Composite Video Monitor

The ZVM-121 is a 13" monitor with a combination circuit. It operates with either RGB or Composite color displaying 40 characters by 25 lines with a resolution of 390x240 pixels.

Zenith ZVM-133 RGB Video Monitor

Teh ZVM 133 is a 13" RGB color monitor that displays 80 characters by 25 lines. It has a 15 MHz bandwidth and a resolution of 640x240 pixels.

Zenith ZVM-135 RGB/COS Video Monitor

The ZVM-135 is a 13" monitor that can be used either with RGB input or composite video. In RGB it displays 80 characters by 25 lines. In the composite video mode it displays 40 characters by 25 lines with a resolution of 640x240 pixels.

Zenith ZVM-136 RGB Monitor

The ZVM-136 is the top 13" unit in the Zenith line. The ZVM-36 has a bandwidth of 20 MHz and displays 80 characters by 25 lines. The resolution is 640x240 pixels.

For information: Zenith Data Systems, 1000 Milwaukee Ave., Glenview, IL 60025. (312) 391-8744, 1-800-842-9000. ●

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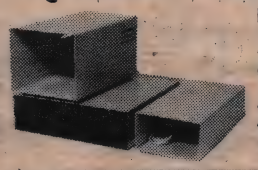

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6264P-15	(150ns)	8192x8	8.00	5514APL-2	(200ns)	1024x4	4.95
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6116P-2	(120ns)	2048x8	4.25	5514AP-2 or -3		1024x4	3.65

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CYEX Systems Announces Phone Security System Based on the TI Speech Command™ System and TI Professional Computer

CYEX Systems Corporation, of Rosemont, Illinois, announced the CYLENCER™, a combination secure phone/executive workstation system that utilizes the Texas Instruments Professional Computer and the TI Speech Command System. CYLENCER offers the same level of security found in dedicated phone security systems and also provides users with a fully-functional personal computer.

"Recent dramatic increases in electronic eavesdropping and surveillance have created a need for a greater number of secure phone lines, to protect sensitive information in government and business," said John Tilley, president of CYEX Systems. "Systems such as the CYLENCER can offer protection from wiretaps and eavesdropping, and are vital in applications such as discussion of sensitive technical and financial information, or information on announcements of a new product. In essence, the application is for any user who is concerned with the confidentiality of his phone conversation, either within the company or to external parties."

According to Tilley, "By using the TI-Speech™ technology, we are able to offer a high quality security system at a price that is lower than dedicated phone security systems, with the added benefit of placing a personal computer on the executive's desk."

CYEX reports that the Speech Command System used in the CYLENCER encodes speech signals into linear predictive code, which models the human voice mathematically. The coded speech is then transferred to CYEX's proprietary Data Encryption Standard (DES) perform-alike cryptographic algorithms. A phone line can be secured with the CYLENCER installed at each end of the connection. The transmitting CYLENCER sends encrypted coded speech over the phone which is decrypted and de-coded at the receiving CYLENCER. The process occurs transparently to the users, with the voices retaining normal phone line quality. The CYLENCER offers six levels of security, including several levels that can be user-defined for varying corporate and individual needs. The high randomness factor of linear predictive code, in combination with the encryption algorithms, makes it extremely difficult to crack, and therefore highly effective against wiretaps or eavesdropping.

The TI Professional Computer can be used to run hundreds of business software programs that can enhance an executive's personal productivity. CYLENCER users can also take advantage of other features of TI's Speech Command System, using it for voice recognition.

The basic CYLENCER system includes a Texas Instruments Professional Computer with single floppy disk drive, 256K random access memory, and monochrome monitor; application software; all necessary Speed Command hardware and software; built-in 4800 baud modem; and a touch telephone. According to CYEX, the CYLENCER will be available in the second quarter for a suggested list price of $12,500 (U.S. only) per end.

For further information contact Texas Instruments Incorporated, Data Systems Group, PO Box 809063, Dallas, TX 75380-9063. 1-800-527-3500.

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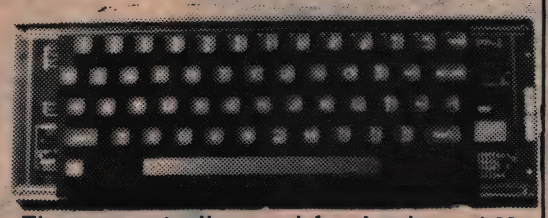

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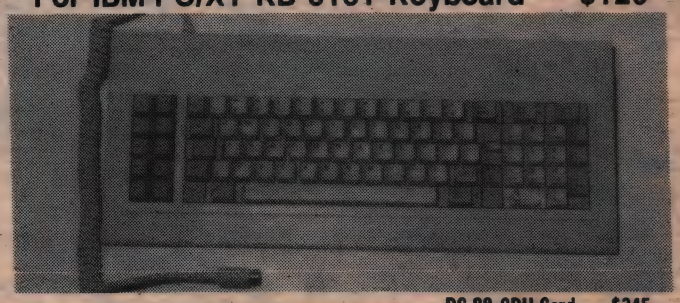

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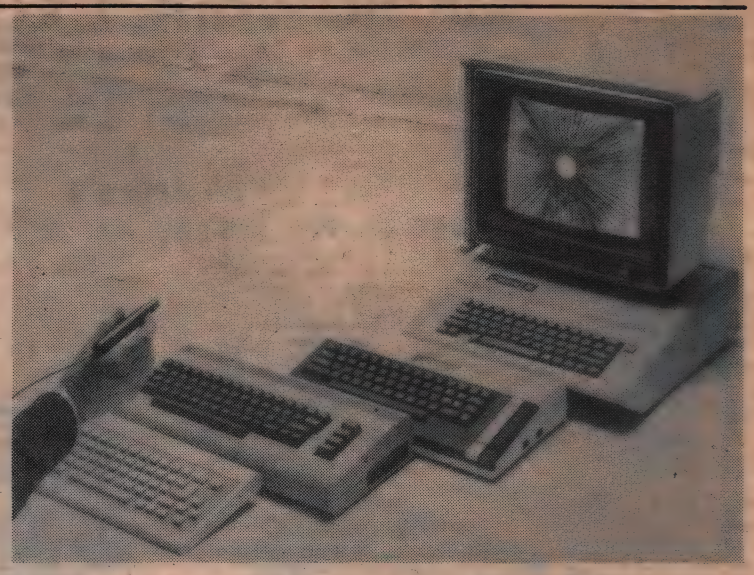
Space Pen
Continued from page 13

(reserved for my Kraft joystick when I'm not in the third dimension) and the other cable which had a pen shaped device attached to the end. By reading the information enclosed, I discovered this was the ultrasonic transmitter. A diskette was enclosed with the system, and being one not to waste time on reading a lot of instructions, I loaded it into my drive and booted-up the software.

I expected a little "Twilight Zone" music from my Apple speaker and a series of 3D graphic images on my display to welcome me to the Third Dimension. Instead I was greeted with a tutorial on the compatibility of the Space Pen with two dimensional devices like the Kraft joystick and the Koala Touch Tablet. I was invited to try my hand at Space Invaders with a floating joystick six feet in front of my computer. I was reminded had this program been written



Space Pen works with many computers

Three Dimensionally that the closer I got to the screen the larger the Invaders would be and the slower they would move so even a clutz like me could be successful with the slightest eye/hand coordination.

The next invitation of the tutorial was to try my hand at painting in space with Koala-like software. The objective of the exercise was to sense a new freedom in selecting Icons on the display and of course to test my creative juices as a Painter/Artist. Once again I was reminded that had this paint program been written for use with the Space Pen, I would be able to change colors, form sizes and even vary picture resolution by moving the Pen in and out in the "Z" axis.

The purpose of the tutorial was to make me aware of the degree of compatibility that my Space Pen had to existing software that I might already own and of course to remind me that if the mechanical devices (Joystick, Touch Tablet) that control other programs should wear out or break, that my Space Pen could substitute for it but only in the x/y planes because that software is only two dimensional.

With my appetite whetted to this new degree of freedom and control of the Apple, what would be my first exploration in the world of the Third Dimension? The answer was in the last program on the Sampler diskette. What, a blank screen! Had I been lead down the path of one and two dimension gamemanship, only to be denied a three dimensional experience? Was the manufacturer inviting me to fill that blank screen with my own creation? Was this another product for my Androbot and his Apple One computer? As I picked up the Pen-like transmitter to throw at the display, a wire form appeared as a speck in the center of the screen. As I moved away the form grew from a small seed to the creation of a Three Dimensional cube floating in space. Then it came to me, my Apple had drawn a Three Dimensional wire form and was challenging me to a game of 3D tic-tac-toe.

Of course, I thought as I sat there positioning my moves in X, Y and Z and pushing the button on the Pen, this is the first board game I had learned as a child. It's only natural that a 3D version be my first experience in the Third Dimension. After matching wits with my Apple I found a programmers guide incuded with all kinds of useful information on signal pin-out, program registers and I/O routines for those with an understanding of the Computers' intricacies. I even found an application form for a contest of the most exciting application in the "Z" Dimension, for you Computer Jocks out there. For those of you without an Apple computer, the Space Pen plugs directly into the joystick port of the Atari, Commodore and IBM personal computers. The Apple and IBM versions are $175 while the Atari and Commodore are $150 from the manufacturer Soniture, Inc., 480 Vandell Way, Campbell, California 95008. ●

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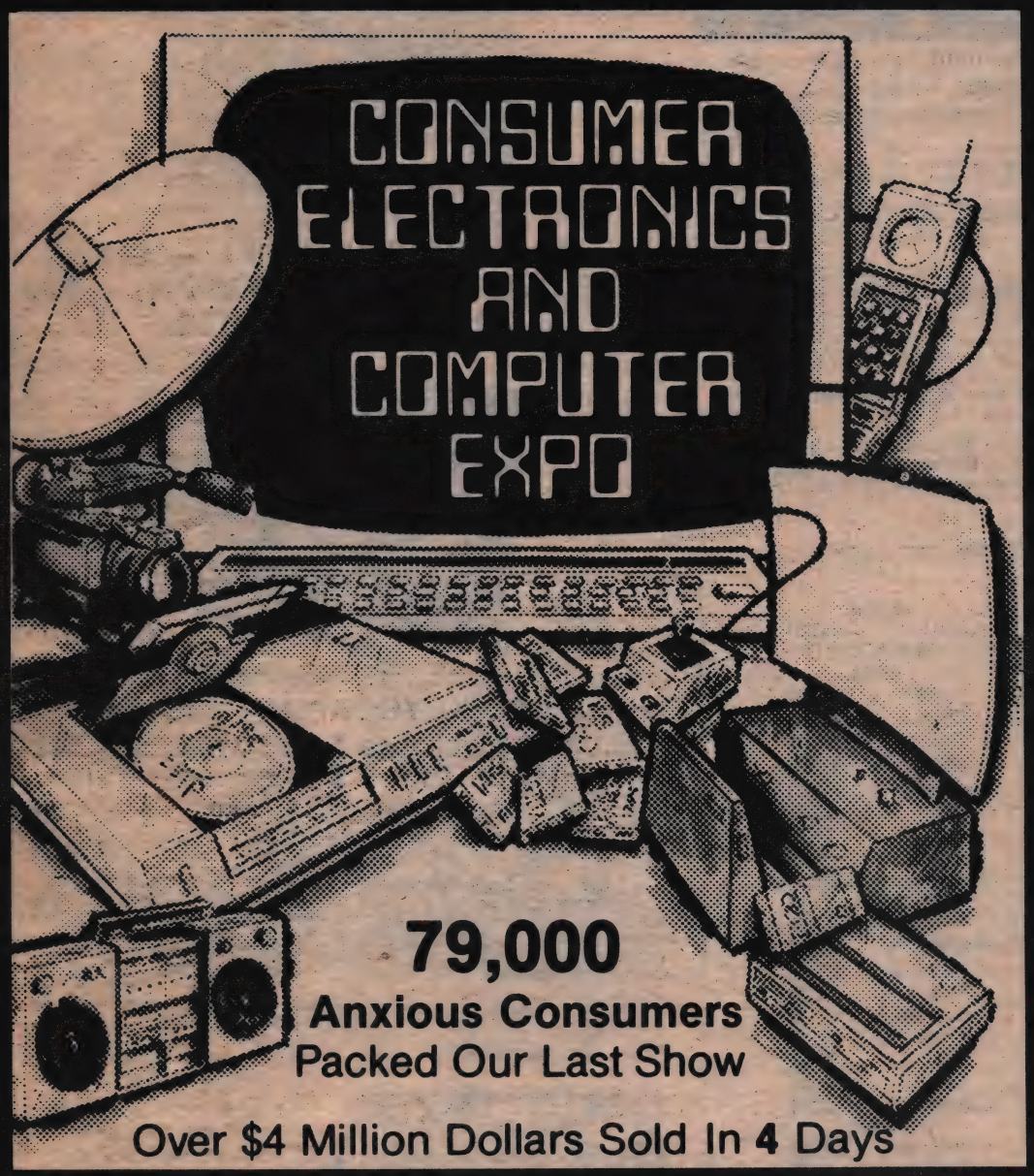

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68XX USERS GROUP, P.O. BOX 30107, HONOLULU, HI 96820
ALOHA 99/4A USERS GROUP, C/O PHILLIP MARKHAM 92865 PALAILAI ST., MAKAKILO, HI 96706
CHAMINADE UNIVERSITY COMPUTER WORKSHOP, 3140 WAIALAE AVE., HONOLULU, HI 96861
HAWAII PORTABLE COMPUTER USERS GROUP, C/O COMPUTER MARKET, HECTOR ROBERTSON, PRES., 578 ALA MOANA BLVD., HONOLULU, HI 96813
HONOLULU APPLE USERS SOCIETY, P.O. BOX 91, HONOLULU, HI 96810

IDAHO

G.H.S. COMPUTER CLUB, GRANGEVILLE HIGH SCHOOL, GRANGEVILLE, ID 83530
IDAHO FALLS COMPUTER CLUB, 1890 EAST 25TH, IDAHO FALLS, ID 83401
POCATELLO COMMODORE USERS, C/O RICHARD HARKER, 421 S. MAIN, POCATELLO, ID 83204
POCATELLO MICROCOMPUTER CLUB, 361 PARK WAY DR., POCATELLO, ID 83201
POCATELLO ORGANIZATION OF WRITERS IN LOGO (O.W.L.), C/O WILLIAM J. McCURDY, 2946 S. 5TH AVE., POCATELLO, ID 83204, 208-233-5422

ILLINOIS

APPLEPEOPLE USERS GROUP, PO BOX 333, CRYSTAL LAKE, IL 60014
The C-64 USERS GROUP, INC., C/O DARRELL HANCOCK & DAVID TAMKIN, P.O. BOX 46464, LINCOLNWOOD, IL 60646
CACHE, CHICAGO AREA COMPUTER HOBBYISTS EXCHANGE, 323 S. FRANKLIN #804, BOX 176, CHICAGO, IL 60606
CHICAGOLAND ATARI USERS GROUP, 520 N. WOOD DALE RD., WOOD DALE, IL
CHICAGOLAND KAYPRO USERS GROUP, 605 ILLINOIS RD., WILMETTE, IL 60091
CHICAGO AREA NORTHSTAR USERS GROUP, PO BOX 9, PARK RIDGE, IL 60068
CHICAGO AREA T-BUG, TANDY BUSINESS USERS GROUP, 26940 NORTH LONGWOOD RD., PO BOX 631, LAKE FOREST, IL 60045
CHICAGO'S FIRST OSBORNE CLUB, C/O ROB TROXEL, PO BOX 943, LIBERTYVILLE, IL 60048
CHICAGO TI99/4A USERS GROUP, TRITON COLLEGE, RIVER GROVE, IL
CIRCLE CHESSCOMPUTER CLUB, PO BOX 63, DES PLAINES, IL 60017
DCN/DENTAL COMPUTER GROUP, C/O E.J. NEIBURGER, 1000 NORTH AVE., WAUKEGAN, IL 60085
EXPLORATIONS EXPLORER-85 S-100, C/O LEROY W. MARSHALL, 808 VASSAR LANE, SCHAUMBURG, IL 60193
FOX VALLEY TRS-80 USER GROUP, 129 S. LINCOLN WAY, N. AURORA, IL 60542
HEURISTICS USER GROUP LOCK BOX 116, BELVIDERE, IL 61008
ILLINOIS COLOR COMPUTER CLUB OF ELGIN, 720 RAYMOND STREET, ELGIN, IL
JOLIET APPLE USERS GROUP, 101 SPRINGFIELD AVE., JOLIET, IL
K * 3 USERS GROUP, RT. 2, BOX 203, MOMENCE, IL 60954
MAX— USERS GROUP**, 5201 MILWAUKEE AVE., 2ND FLOOR, CHICAGO, IL
MID ILLINOIS APPLE USERS GROUP, PO BOX 526, EFFINGHAM, IL 62401
MID ILLINOIS COMP. RESOURCE ORGANIZATION, PO BOX 766, BLOOMINGTON, IL 61701
MTPUG PASCAL/MT USERS GROUP, PO BOX 192, WESTMONT, IL 60559
99/4A OWNER USERS GROUP, 8602 DORR RD., WONDER LAKE, IL 60097
NTHERN ILLINOIS APPLE USERS GROUP, 1271 WEST DUNDEE RD., BUFFALO GROVE, IL 60090
NORTHERN ILLINOIS COLOR COMPUTER CLUB, 1217 KINGS COURT #12, WEST CHICAGO, IL 60185
NORTHERN ILLINOIS COMPUTER OWNERS, 26 W. 484 BUTTERSFIELD, WHEATON, IL 60187
NORTHERN ILLINOIS IBM-PC USERS GROUP, UNION OIL BUILDING, SCHAUMBERG, IL
ONE ON ONE, 948 PROSPECT AVE., ELMHURST, IL 60126
PEORIA ATARI COMPUTER ENTHUSIASTS, PO BOX 32, WASHINGTON, IL 61571
PUBLIC ACCESS MICROCOMPUTER USERS GROUP, ARLINGTON HEIGHTS MEMORIAL LIBRARY, 500 NORTH DUNTON, ARLINGTON HGTS., IL 60004
S.U.N., SINCLAIR USERS NETWORK, 2170 OAK BROOK CIRCLE, PALATINE, IL 60067
SINCLAIR END USERS' GROUP, C/O DIANA WRIGHT, 2170 OAKBROOK CIRCLE, PALATINE, IL 60067
SOSUG-COMMODORE 64, C/O MACEY B. McKEE, WESL Institute, Western Illinois Univ., Macomb, IL 61455
SOUTH SUBURBAN MICROCOMPUTER USER GROUP, FREEDOM HALL, 410 LAKEWOOD BLVD., PARK FOREST, IL
UNION PIRATES, BOX 566, GRANVILLE, IL 61326
WACO (WOODFIELD AREA COMPUTERIST'S ORGANIZATION), QUINLAN & TYSON BLDG., SCHAUMBURG, IL 60194
WESTERN ILLINOIS PET USERS GROUP, RTE. 5, BOX 75 QUINCY, IL 62301
WILL COUNTY COMPUTER USERS, LOCKPORT LIBRARY, 8TH & HAMILTON, LOCKPORT, IL
Z-80 STARTER KIT USER'S GROUP, 6000 PUFFER RD., DOWNERS GROVE, IL 60516
WAUKEGAN APPLE USERS GROUP, C/O CURT ROSTENBACH, P.O. BOX 8757, WAUKEGAN, IL 60079

INDIANA

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COMMODORE COMPUTER CLUB, 3814 TERRA TRACE, EVANSVILLE, IN 47711, C/O JOHN PATRICK
EVANSVILLE COMPUTER CLUB, PO BOX 3284, EVANSVILLE, IN 47732
FORT WAYNE APPLE COMPUTER USES GROUP, PO BOX 11507, FORT WAYNE, IN 46858
GROUP-I/OSBORNE & OTHER PORTABLES, P.O. BOX 205, BEECH GROVE, IN 46107
HOOSIEN USERS GROUP, PO BOX 34334, INDIANAPOLIS, IN 46734
INDIANA HEATH USERS GROUP, 5113 DICKSON RD., INDIANAPOLIS, IN 46226
INDIANA OSBORNE USERS, 317 NORTH FESS, BLOOMINGTON, IN 47401 812-339-4754
INDIANAPOLIS SMALL SYSTEMS GROUP, PO BOX 40733, INDIANAPOLIS, IN 46240
KOKOMO APPLE USERS GROUP, 2315 W. JEFFERSON ST., KOKOMO, IN 46901
LAUG - LAYFAYETTE APPLE USERS GROUP, 519 SOUTH 31st ST., LAFAYETTE, IN 47904
MARION APPLE COMPUTER CLUB, C/O COMPUTER DEPT., JONES MIDDLE SCHOOL, MARION, IN 46952
MIAMI COUNTY AREA 99/4A HOME COMPUTER USERS GROUP, 163 W. 3rd, PERU, IN 46970
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MUNCIE PC USERS GROUP, 2809 E. JACKSON ST., MUNCIE, IN 47303
NORTHEAST COMPUTER CLUB, PO BOX 50252, INDIANAPOLIS, IN 46250
QDP, P.O. BOX 271, HUNTINGTON, IN 46750
SOUTHERN INDIANA APPLE USERS GROUP, 5900 TWICKINGHAM DR., EVANSVILLE, IN 47711
SOUTHERN INDIANA COMPUTER CLUB, RT. 1, BOX 459, MITCHELL, IN 47446
TERRE HAUTE KAYPRO USERS GROUP, P.O. BOX 4, TERRE HAUTE, IN 47808
THE CENTER COMPUTER ORGANIZATION, PO BOX 6031, SOUTH BEND, IN 46660-6031
TIMEX 1000 NATIONAL SOFTWARE EXCHANGE, C/O GREG GUNTHORP, RR2 BOX 162, LaGRANGE, IN 46761

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CEDAR VALLEY 99ER USERS GROUP2705 16TH AVENUE, MARION, IA 52303
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IOWA USER GROUP, 844 10 ST. N.E., MASON CITY, IA 50401
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THE PLANE APPLE CLUB, PO BOX 47396, WICHITA, KS 67201
TI INTEREST GROUP, 5522 EAST HARRY, WICHITA, KS 67218
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PORTSMOUTH T/S USERS GROUP, C/O JOHN MARION, HC 63 BOX 650, GREENUP, KY 41144 (606)473-6791
THE COMMODORE CONNECTION, C/O JIM KEMP, 1010 S. ELM, HENDERSON, KY 42420

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BATON ROUGE COMPUTER CLUB, PO BOX 80648, BATON ROUGE, LA 70898-0648
BATON ROUGE PC USERS GROUP, C/O TOMWICHSER, 3375 KING BRADFORD, BATON ROUGE, LA 70816
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APPLE-USERS IN MAINE SCHOOLS, C/O RALPH GRANGER, UNIV. OF MAINE, FARMINGTON, ME 04938
COLOR COMPUTER MAGAZINE, HIGHLAND MILL, CAMDEN, ME 04843
99/4A USER GROUP OF SOUTHERN MAINE, ATT: JOHN LEEKE, RR1 BOX 847, SANFORD, ME 04073
SO. ME. 64, C/O ED MOORE, 9 LYNDA ROAD, PORTLAND, ME 04103
SOUTHERN MAINE TRS-80 USERS GROUP, 82 WELLINGTON ROAD, PORTLAND, ME 04103
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BALTIMORE APPLE USERS GROUP, PO BOX 13522, BALTIMORE, MARYLAND 21203
BALTIMORE COMMODORE USERS GROUP, 3121 ABEL AVENUE, BALTIMORE, MD 21218, ATTN: PAUL MOSCITT.
BALTIMORE SANYO USERS GROUP, C/O MARK KURZMACK, 809 W. BARRE, BALTIMORE, MD 21230
B.C.C. BETHESDA CHEVY CHASE ATARI USER GROUP, C/O ANDREW DILLER, 3316 SHEPHERD ST., CHEVY CHASE, MD 20815
CAPITOL AREA TIMEX/SINCLAIR USERS GROUP, C/O JULES GESANG, PO BOX 725, BLADENSBURG, MARYLAND 20710
CARROLL BITS USERS GROUP, C/O JOHN P. SANDS, 4401 LONDON BRIDGE RD., SYKESVILLE, MARYLAND 21784
CHESAPEAKE MICROCOMPUTER CLUB, INC., 1618 TILTON DR., SILVER SPRINGS, MD 20902
CUMBERLAND VALLEY APPLE USER'S GROUP, 806 FREDERICK ST., HAGERSTOWN, MD 21740
E-COM USERS GROUP, INC., BOX 888, RIVERDALE, MD 20737, C/O DELILA TWOOP
EDISON COMMODORE USERS GROUP, 4314 OXFORD DR., SUITLAND, MD 20746
FREDERICK APPLE CORE, 1835 MEADOWGROVE LANE, FREDERICK, MD 21701
GAITHERSBURG C-64 USERS GROUP, 12937 PICKERING DR., GERMANTOWN, MD 20874
HUG-HAGERSTOWN USERS GROUP, JOE RUTKOWSKI, PRES., 23 COVENTRY LN., HAGERSTOWN, MD 21740, (301) 797-9728
JUMPERS 2064s (GLEN BURNIE), 7837 B&A BLVD., GLEN BURNIE, MD 21061
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MUMPS USERS GROUP, 4321 HARTWICK RD., SUITE 510, COLLEGE PARK, MD 20740
NEC USERS GROUP, 7121 LORY LN., LANHAM, MD 20706
ROCKVILLE VIC/64 USERS GROUP, PO BOX 8805, ROCKVILLE, MD 20856
SOUTHERN MD COMMODORE USERS GROUP, 6800 KILLARNEY ST., CLINTON, MD 20735
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TELECOMMUNICATIONS FOR THE DEAF, 5702 FOREST RD., CHEVERLY, MD 20785
THE BOYDS CONNECTION, 21000 CLARKSBURG, RD., BOYDS, MD 20841
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WASHINGTON APPLE PI, 8227 WOODMONT AVE., SUITE 201, BETHESDA, MD 20814
WASHINGTON AREA RAINBOW USER'S GROUP, 6415 ADELPHI ROAD, UNIVERSITY PARK, MD 20782, 301-927-0108

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BOSTON COMPUTER SOCIETY, 17 CHESTNUT ST., BOSTON, MA 02108
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NBE BIRD WATCHERS' COMPUTER CLUB, 31 PLUMMER AVENUE, NEWBURYPORT, PA 01950
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NEWTON APPLE KIDS, 77 ROCKPORT RD., WESTON, MA 02193
NORTH SHORE APPLE GROUP, PO BOX 59, ROCKPORT, MA 01966
PET USERS GRP, WALTHAM HS, NOSTON, MA 02154
SMUDGE (DIGITAL GROUP), C/O JEB BOSWELL, M.D., 29 KENILWORTH ST., NEWTON, MA 02158
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TRVDGEM-TRS-80-MODEL 3/4P USERS GROUP, C/O BILL HEISER, KENDALL SQ. BOX 891, CAMBRIDGE, MA 02142

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CANTON COLOR COMPUTER CLUB, C/O WADE R. HAMPTON, PO BOX 87586, CANTON, MI 48187-0586
CAPITOL HILL ATARI OWNERS SOCIETY (C..A.O.S.), PO BOX 16132, LANSING, MI 48901
CENTRAL MI TRS 80, 220 E. KALAMAZOO, LANSING, MI 48932
CENTRAL MICHIGAN TRS-80 USERS GROUP, 1309 WOODINGHAM DR., EAST LANSING, MI 48823
COLOR COMPUTER OWNER'S GROUP, PO BOX 1113, DEARBORN, MI 48121
DEARBORN TRS-80 (TM) USERS GROUP, C/O PAUL SOCKOW, P.O. BOX 1942, DEARBORN, MI 48121
DETROIT INTERACT GROUP, 15356 PREVOST, DETROIT, MI 48227
DETROIT FIRST OSBORNE USERS GROUP, 17452 STAMWICK, LIVONIA, MI 48152, (313) 422-0928
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GRAND RAPIDS APPLE (GRAPPLE), 5326 BROOKWOOD DR. S.E., KENTWOOD, MI 49508
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GREAT LAKES COMPUTER GROUP (TI99/4A), PO BOX 7151, ROSEVILLE, MI 48305
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SAF USERS GROUP, C/O ROBERT DODGE, PO BOX 313, Mason, MI 48854
SAULT AREA TRS-80 USERS GROUP, C/O JACK DECKER, 1804 WEST 18TH ST. #155, SAULT STE., MARIE, MI 49783
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MINN COMP SOC, 8100 34TH AVE. S., MINNEAPOLIS, MN 55401
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GUM TREE COMPUTER CLUB TRS-80 & APPLE, 2609 PEMBERTON, TUPELO, MS 38801, C/O RICHARD SWINEY
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HUB-80 USERS GROUP, C/O EUGENE PIERSOL, P.O. BOX 3713, HATTIESBURG, MS 39401
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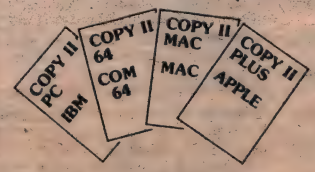

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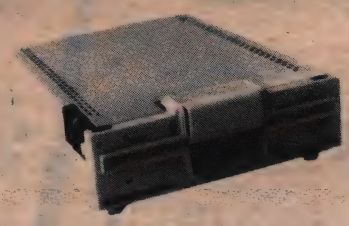

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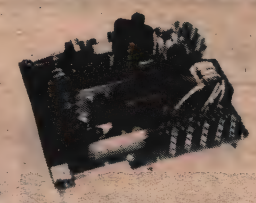

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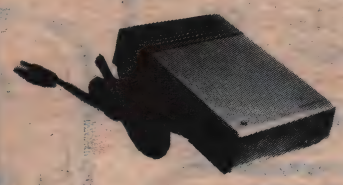

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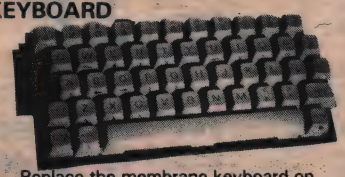

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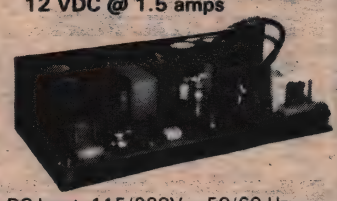

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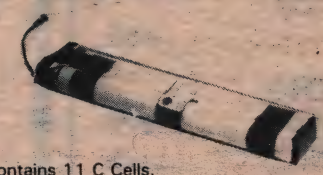

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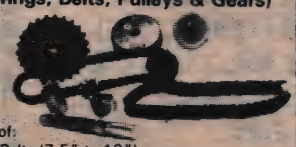

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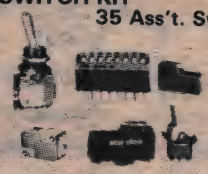

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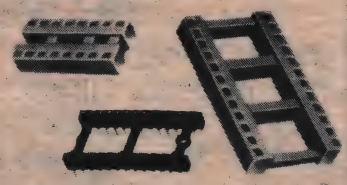

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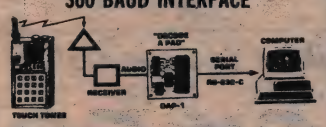

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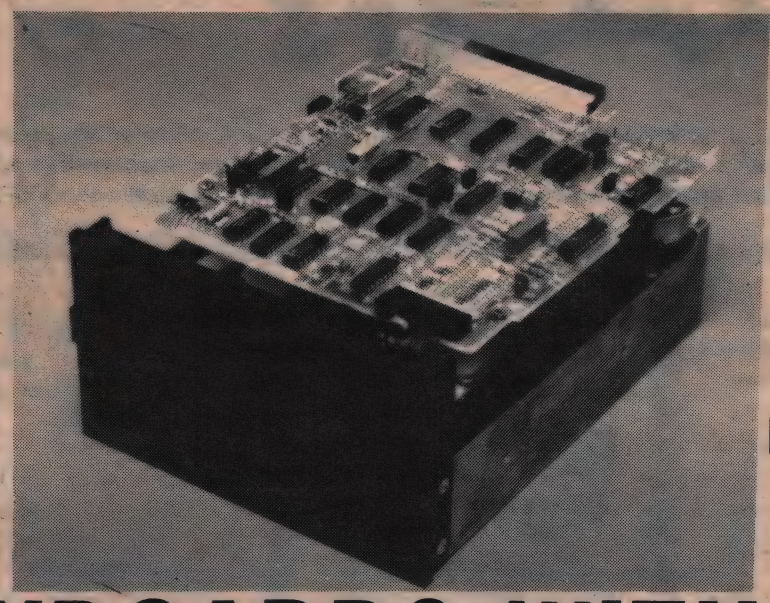

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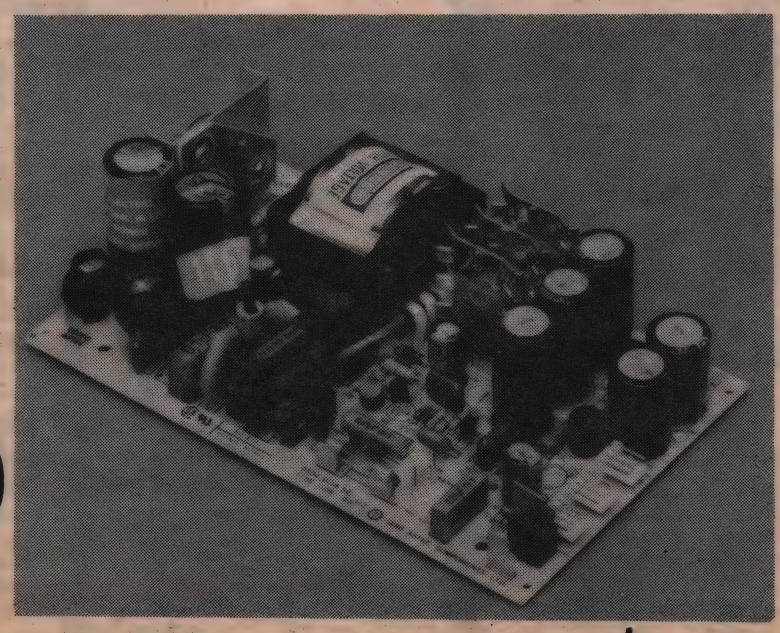

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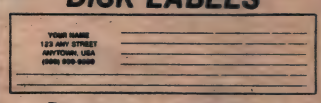

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DESCRIPTION: Family is a genealogical data base which handles data for 255 ancestors in eight generations. Three printouts are available: Pedigree chart, Family group chart, and a Reference number index.
PUBLISHER: Petrocci Freelance Associates, 651 North Houghton Road, Tuscon, AZ, 85748, (602) 296-1041.
COST: $29.95 (disk)

NAME: JUDY
TYPE: Time management program
COMPUTER: IBM PC compatible
DESCRIPTION: Judy keeps track of everything you ought to be doing, and she doesn't let you forget. More exactly, she is a "personal nag". Her personality consists of two interlocked but independent modules: a full-screen, full-featured interactive calendar, and a background companion that runs concurrently with any other MSDOS software.
PUBLISHER: New-Functions, P. O. Box BB, Staten Island, NY, 10302.
COST: $29.95

NAME: SCROLL & RECALL
TYPE: Resident screen and keyboard enhancement utility
COMPUTER: IBM-PC, XT, AT
DESCRIPTION: Scroll & Recall adds two facilities to MS-DOS systems: 1) It gives you the ability to scroll back through data that has gone off the top of your display screen; and, 2) It also saves your DOS commands as you enter them.
PUBLISHER: Opt-Tech Data Processing, P. O. Box 2167, Humble, TX, 77347, (713) 454-7428.
COST: $69.00.

NAME: MAILER
TYPE: Mailing list manager
COMPUTER: IBM PC/XT/AT/portable/jr, and many compatibles as well as many CP/M-80 systems.
DESCRIPTION: Mailer is prestructured, requiring no setup of the database, screen entry form, label and envelope formats or reports. It runs solely from selection menus and prompts. In addition to the usual sorting, selecting, merging, and purging features, varying length labels can now be printed as well as index-Rolodex cards.
PUBLISHER: Maurizi Associates, 1344 Fitch Way, Sacramento, CA, 95864, (916) 486-2293.
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NAME: smARTWORK
TYPE: Printed circuit-board artwork software
COMPUTER: IBM PC/AT, also available for the IBM PC and PC/XT
DESCRIPTION: smARTWORK is a low-cost tool for creating printed circuit-board artwork software. It allows quick correction and revision of artwork, increasing design productivity and decreasing product-development time. Elementary functions are easy to learn, while advanced techniques allow sophisticated layouts. The layout can be displayed in either color or black-and-white.
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DESCRIPTION: These programs, written entirely in BASIC, computerize any routine tasks and forms for Amway Product Distributors, including Order Verify/Generate (with over 400 products and prices in memory), Monthly Bonus Calculation, Monthly Gross Profit, Distributor Family Tree, Ledger, Word-Processor, Mailing List, Telephone Programs, etc.
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NAME: FUN WITH DIRECTIONS
TYPE: Pre-school educational program
COMPUTER: Apple II series
DESCRIPTION: Is actually a set of three games for the pre-reader and beginning reader. It needs no adult supervision, as the individual student controls the game with only the Space bar. Colorful, animated illustrations of letters, animals and other objects teach and reinforce such concepts as rows, sameness and sequence in countless variations.

PUBLISHER: Learning Well, 200 South Service Road, Roslyn Heights, NY, 11577, (800)-645-6564, in New York (516)-621-1540.
COST: $49.95

NAME: MY VERY OWN CALENDAR
TYPE: Educational program
COMPUTER: Apple II series
DESCRIPTION: Is a new learning program for primary grade-level children. The colorful graphics and fun-filled games provide users with a wide range of learning activities. They can enter holidays, special days, weather conditions, etc.

PUBLISHER: Learning Well, 200 South Service Road, Roslyn Heights, NY, 11577, (800)-645-6564, in New York (516)-621-1540.
COST: $49.95

NAME: MI-KEY
TYPE: utility program
COMPUTER: Sanyo MBC-550/555
DESCRIPTION: This program actually does the typing for you. It lets you redefine any of the keys on your keyboard to represent other keys, a combination of keys, or even complete commands.
PUBLISHER: MichTron, 576 South Telegraph, Pontiac, MI, 48053, (313)-334-5700.
COST: $34.95

NAME: GRAFPAC
TYPE: Software library
COMPUTER: Sanyo MBC-550/555
DESCRIPTION: Includes routines to clear screen to any color, set and read screen points, draw lines, rectangles, filled boxes, wedges, arcs, circles, ellipses, and polygons, paint complex shapes, print normal and magnified text, calculate sine and cosine, read joystick port (for BASIC language also), create sounds and tones, and capture and display portions of the screen or memory. GRAFPAC opens new avenues for everything from technical illustrations and business graphs to drawing and video games. You can even use pictures created from the fabulous Picasso drawing system!
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NAME: TRAVELING EXPENSE MANAGER
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COMPUTER: IBM-PC and PC-compatibles
DESCRIPTION: keeps track of both business and personal expenses. Users may set up their own expense accounts and fund types. A special automobile mileage tracking feature figures overall trip miles and trip costs. Many on-screen or printed summaries allow users to check the status of expenses. Included with the Traveling Expense Manager is a new program, the Desktop/Laptop Bridge. The Bridge converts data created on a laptop computer for use on a desktop computer, and vice versa. The Traveling Expense Manager and the Desktop/Laptop Bridge make a "One Box Solution" to expense management on laptop portable and desktop office computers.
PUBLISHER: Traveling Software, Inc., 11050 Fifth Avenue, N.E., Seattle, WA, 98125, (206)-367-8090.
COST: $99.95

NAME: SLIDEWRITE
TYPE: graphics software package
COMPUTER: IBM-PC and true compatibles
DESCRIPTION: combines the ease-of-use typical of the best word-processors with output quality previously available only from mainframe computer graphics packages. It is designed for immediate use by business professionals who frequently use presentations in their jobs.
PUBLISHER: Advanced Graphics Software, Inc., 333 West Maude Avenue, Suite 105, Sunnyvale, CA, 94086, (408)-749-8620
COST: $225.00

NAME: ABL-64
TYPE: automatic boot loader for Commodore 64.
COMPUTER: Commodore 64
DESCRIPTION: will re-boot and run an essential program after a power failure, even if the computer is left unattended. It can pick up where it left off before the power failure. Is an

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inexpensive alternative to battery power backup systems.
PUBLISHER: Input Systems, Inc., 15600 Palmetto Lake Drive, Miami, FL, 33157, (305)-252-1550
COST: $39.95

NAME: CAUSE AND EFFECT
TYPE: learning program
COMPUTER: Apple II family of microcomputers
DESCRIPTION: The difference between deductive and inductive reasoning is the subject of this computer program. It also introduces new problem-solving tools which can be used in everyday life. The combination of the fun of an arcade game and the challenge of the "FORCE" to exercise reasoning skills will captivate the students.
PUBLISHER: Marshware, P.O. BOx 8082, Shawnee Mission, KS, 66208, 800-821-3303.
COST: $39.95

NAME: WATSON
TYPE: personal office automation system
COMPUTER: IBM-PC or PC compatible
DESCRIPTION: a combination of hardware and software enables this program to become the office automation system. Some of the capabilities are (1) an automatic time billing system. (2) dictating machine with editing capabilities, and (3) an automatic dial-up and log-on system for public access databases.
PUBLISHER: Natural MicroSystems Corporation, 6 Mercer Road, Natick, MA, 01760, (617)-655-0700.
COST: $849 with 300 baud modem capability and $998 with 300 and 1200 baud capability.

NAME: MICRO MEDPLAN
TYPE: health care program
COMPUTER: Compatible with most computers
DESCRIPTION: performs all the necessary Medicare/Medicaid cost-report computations, allowing for experimentation with different reimbursement options. Other features include (1) a built-in analyzer that alerts you to erroneous entries, (2) all calculations performed in under two minutes, and (3) approved by HCFA.
PUBLISHER: Coopers & Lybrand, 1251 Avenue of the Americas, New York, NY, 10020, (212)-903-3112
COST: No cost given as yet.

NAME: THOMAS
TYPE: residential property management software
COMPUTER: IBM-PC XT and AT computers and compatibles.
DESCRIPTION: assists the residential property manager with daily tenant management, unit maintenance, and prospective tenant information.
PUBLISHER: Classic Software, Inc., 120 Interstate North Parkway East, Suite 157, Atlanta, Georgia, 30339, (404)-442-0765.
COST: $1,500.00

NAME: ABLE ONE MAILING LIST
TYPE: mailing label program
COMPUTER: CP/M 2.2 based microcomputers with two disk drives and printer capable of 132 columns
DESCRIPTION: ability to print mailing labels in five different formats. There are four additional fields in each record for date, telephone number and two amount fields if desired.
PUBLISHER: Able Data Software, Inc., 2nd Floor, 1260 Hornby Street, Vancouver, B.C., V6Z 1W2.
COST: $19.95

NAME: SPELLING CHECKER
TYPE: educational program
COMPUTER: Commodore 64, Atari, IBM PC/PC jr, TI 99/4A.
DESCRIPTION: features a built-in dictionary of over 20,000 words to identify spelling errors. SPELLING CHECKER is a simple-to-use tool for improving study habits, written work quality, and planning class assignments.
PUBLISHER: Navarone Industries, Inc., 510 Lawrence Exp. #800, Sunnyvale, CA, 94086.
COST: No available

NAME: DATA BASE MANAGER
TYPE: filing and reporting system
COMPUTER: Commodore 64, Atari, IBM PC/PC jr, TI 99/4A.
DESCRIPTION: Comprehensive program that controls customer activity, organizes inventory, and tracks business transactions. It allows you to develop and organize your files, design your own screen, customize data entry and index information by multiple keys. A powerful sort utility will organize entire disk files in any sequence by up to six keys.
PUBLISHER: Navarone Industries, Inc., 510 Lawrence Exp. # 800, Sunnyvale, CA 94086.
COST: Not available

NAME: AUTHOR PLUS COLOR
TYPE: computer authoring system
COMPUTER: IBM-PC (128K two double side disk drives), PC/XT, PC/AT and compatible computers.
DESCRIPTION: The features of 16 color text and character graphics, single entry/editing screen for all frame types, real fill-in-the-blank questions with key word answer analysis, sequencing questions where learners can enter up to eight items in proper order, page ahead, page back capability, ability to print graphic libraries with standard printers, design of completion screen to simulate data entry in other application software, and graphics/text included anywhere in instructional/question frames are some of the new features of Author Plus Color.
PUBLISHER: Raptor Systems, Inc., 324 South Main Street, Suite 1, Stillwater, MN, 55082, (612)-430-2980
COST: $595.00

NAME: PRO FOOTBALL ANALYST
TYPE: POINT SPREAD BETTING ANALYZER
COMPUTER: TI99/4A (IBM-PC version coming soon)
DESCRIPTION: Put your computer to work uncovering hidden overlays in the betting line for both NFL and USFL games. This program incorporates the outstanding handicapping analyzer, the Ridge System, to easily determine your selections in only 5-minutes each week! A rewarding program that pays for itself whether you make serious wagers or just enjoy playing the office football pool. Do not be fooled by imitators - Pro Football Analyst is the original computerized handicapper. It really works!
PUBLISHER: Ridge Services, 170 Broadway, Suite 201-SSL, New York, NY, 10038, (718)-833-6335.
COST: $35.00

NAME: WORDS OF FORTUNE
TYPE: learning game
COMPUTER: Apple IIe and IIc
DESCRIPTION: This game combines a fast-paced spin of a wheel with over 1,000 unduplicated game items, special sound effects, and a stimulating BONUS ROUND. The purpose of the game is to accumulate 10,000 points by guessing the correct letters in the answer with the aid of category clues such as PERSON, PLACE, THING, TITLE, and EXPRESSION.
PUBLISHER: Fortune Software Co., 70 Sierra Rd., Boston, MA, 02136, (617)-361-1956.
COST: Standard Edition - $49.95, Management Edition - $79.95.

NAME: EXPRESS
TYPE: Letter Processor
COMPUTER: IBM PC, Apple IIe and IIc
DESCRIPTION: Is a letter processor which contains the four functions used most frequently by business people. These functions are, a Typewriter, a Word Processor, a Mail List/Merge, and the capacity to Print.
PUBLISHER: Mirage Concepts, Inc., toll free in California at 800-641-1442, and outside of California at 800-641-1441.
COST: $29.95

NAME: TARGETS
TYPE: a number game
COMPUTER: 48K Atari, Apple II series, TRS-80 Models III & 4
DESCRIPTION: challenges students to play with, develop and expand their knowledge of numbers. The game consists of a pair of numbers from 1-9, the mathematical operation(s) to be used with the numbers, and a target number from 0-99. Players must combine the numbers with the operation(s) to arrive at the designated target. This is a help with practicing basic math problems and to analyze the most efficient solutions to a problem.
PUBLISHER: Sunburst Communications, Inc., 39 Washington Avenue, Pleasantville, NY, 10570, (800)-431-1934 or (914)-769-5030.
COST: $55.00 includes one disk plus backup and teacher's guide.

NAME: DISKETTE MANAGER II
TYPE: diskette library management program
COMPUTER: IBM
DESCRIPTION: automatically reads the directory from each diskette and prepares a catalog with that information and the user-provided comments. As diskettes are read into the catalog, labels may be printed for them containing diskette name and 6 lines of comments (user provided), creation date, number of files, and amount of disk space remaining.
PUBLISHER: Lassen Software, Inc., 468 Manzanita Avenue, Suite 5, Chico, CA, 95926, (916)-891-6957.
COST: $99.95

CLASSIFIED

CLASSIFIED INFORMATION

The classifieds are for **Pre-Owned Items & Software ONLY.** New equipment, Services, etc. must use regular Display space.

Instructions

In order for us to keep the ad rate low and insure accuracy, it is necessary that the following procedures are followed.

1. Type or print your ad legibly on a plain sheet of paper. Ads received that are difficult to read will be returned.
2. **Write the desired category at the top of each ad. Please refer to the index, this page. If a category is not indicated, ad will be placed in the Miscellaneous section.**
3. If more than one ad is submitted, use a separate piece of paper for each ad, making sure your complete name and address is at the bottom of each ad.

CLOSING DATE — 2nd Monday of the month. Example: the closing date for June's Issue is the 2nd Monday of April. **Due to our low rates, you cannot change, cancel or receive a refund on classifieds after they are typeset.** In most cases, ads are typeset within a week after they are received.

RATES — Subscribers: 17 cents per word. $3.00 per ad minimum charge. The first two words (if underlined) will be set in bold face at no additional charge. Bold face or all cap words thereafter will be thirty-four (34) cents per word. Special bold headings, partial lines, open space or leader dots are:

8 point line, $1.22 cents per line.
10 point line, $1.73 per line.

Maximum of 15 characters per line.

Non-subscriber rates are double all rates listed above.

REPEAT ADS

Ads running more than one time. A repeat ad will be coded at the end of the ad with the month ad started and issue ad ends. Example: 8-160. Ad started Aug. ends 160 issue or January. NOTE: Please check to make sure your ad has been correctly coded.

PROOFS

Due to low classified rates a free checking copy or tear sheet cannot be sent if proof of insertion is desired, please send $3.00 extra.

PHOTOS

A photo will draw attention to your ad. Photos are $7.00 per column inch. Please send in B/W photos, preferable 4x5's cropped horizontally. Include your name and address on the back of each photo. If photo looks like it is more than one inch send in money for two inches or more.

★ $5.00

★ ★ $4.00

★ ★ ★ $3.00

STARS

Have a special piece of equipment to sell? Reducing the price of an item and want to attract attention to that fact? Take advantage of our low price "star" attention getters.

It's a fact...unusual "artwork" in or above an ad draws attention that ad and the reader retains interest in that product longer.

GET RESPONSE QUICKER with "Stars" above your ad. Below is the rate for different sizes. Just mark "stars" and the price of the one you choose above your ad copy and we'll take care of the rest. Be sure to include the cost with your ad payment.

CS-ABBREVIATIONS

add-post . . . . . add postage
add-post-AP . . . add postage, all prices
FC . . . . . Freight Collect
MBG . . . . . money back guarantee
PP . . . . . postage paid
SASE . . . . . send self-addressed stamped envelope for . . . . . check return or . . . . . information requested
10 DRP . . . . . 10 day return privilege
CCR . . . . . check clearance required

EXAMPLE OF STYLES:

Normal

PDP 11/03 COMPUTER. Complete operating system with RT-11 system software plus basic. Brand new October '78. Sell complete at $7,000, or separate at: 11/03 Computer $900. Dual RX-1 disk $1,000. 32KB memory $2,800. VT-52 video $1,500. GE Terminet 30 printer $800. Intertube video terminal $400. **John Doe,** POB 1234, Somewhere, USA 00000. 123-456-7890.

10 Point Centered Head

PDP 11/03 COMPUTER

Complete **OPERATING SYSTEM** with RT-11 system software plus basic. **John Doe,** POB 1234, Somewhere, USA 00000. 123-456-7890.

Individual Listings

PDP 11/03 COMPUTER

Complete **OPERATING SYSTEM** with RT-11 system software plus basic. Brand new October '78. Sell complete at $7,000, or separate at:

11/03 Computer $900
Dual RZ-1 disc $1,000
32KB memory $2,800
Intertube video terminal $400

John Doe, POB 1234, Somewhere, USA 00000. 123-456-7890.

CLASSIFIED ORDER FORM

Classified Dept., COMPUTER SHOPPER
P.O. Box F, Titusville, FL 32781

To figure cost of ad, the rate is 17 cents per word, (34 cents per word bold face) $3.00 per ad minimum charge.

Run under heading # _____
See Index This Page
(Please type or print)

INCLUDE 17-CENTS PER WORD FOR YOUR NAME AND ADDRESS

Name _____

Address _____

City _____

State _____ Zip _____

INCLUDE 17-CENTS PER WORD FOR YOUR NAME AND ADDRESS

(For additional words, use separate sheet of paper)

Remittance for $_____ is enclosed.
You may run my ad _____ issues.

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(101) TRS-80 COMPUTERS FOR SALE

2000 AT A STEAL! Tandy 2000, 2 Drives, 256K, Monitor $1995 with 90 day warranty. **Godfather's Used Computer Syndicate,** P.O. Box 3037, 1154 W. SR 436 Forest City, FL 32714, (305)774-1111 4-65

5MEG Hard Disk $1,100, DMP-2100 Printer $1,200, Model I, expansion, 2 Drives, RS232, Gold Connectors, $800. Rick **616-385-4109.**

64K MODEL-II $1500. Exp. unit with 3 drives $1000. Line printer V $700. All with original manuals. Buy all for $2900. Call **Fred Dunham** in St. Louis 314-355-1606. 5-65

★ ★ ★

COLOR COMPUTER SYSTEM—64K ECB EXCELLENT condition; **SWITCHABLE INVERSE VIDEO; NUMERIC KEYPAD;** TANDON DISK DRIVE; Software: WORKSAVER PLUS; PRO COLOR FILE: VIP WRITER; ELITE CALC; numerous games. $800+ value—$600 or make offer, Bare Drives—Brand new Tandon 40T, $75, WORKSAVER PLUS—Excellent utility for programming or typing in BASIC programs, $25, WORDPAK 80 COLUMN CARD for CoCo, Version 1. Slightly used, $80, ELITE CALC—Excellent spreadsheet program. Retails @ $69.95, $25, PLANET INVASION $8, ROBOTACK $8. pp, John Boals, 494 Cline Ave., Mansfield, OH 44907, **419-756-4873.** 5-65

Complete office computer system. Tandy model 16a with four disk drives, 512K ram, DMP 2100 printer with tractor feed, Hayes modem and much more. We are going to a mini. CAll Bob at **219-424-2761.**

For Sale, Holmes VID-80 and "Sprinter-III." Give your Model-III C.P.M. with 112k. Memory and fast speed. Also have C.P.M. 2.2 and many programs incl. dBASE-II. The entire group for $285, original cost over $1,000. Call **803-244-6396** (evenings) for futher info.

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Like New Model 4P, 2 Drive, 128K with TRSDOS 6.2 and CPM plus operating systems. Many MODIII software packages thrown in as well. Best offer takes all. Call Russ at area **402-345-2106** Mon-Fri: 10AM-5PM or area 402-292-1930 after 7PM Mon-Sun.

Line Printer VIII. Letter Quality Dot Matrix. Good Condition. $300. Plus Shipping. **Steve Pecoraro,** 5409 Gridley, Riverside, CA 92505. Compuserve 70025,1117. 5-65

Loaded Model III. System includes 2 TEAC ½ height 5¼ inch floppy drives, RS-232 serial port, 48K RAM, volksmodem with cable. All boards and drives only 8 months old or less! Software includes SuperScripsit, Profile III+, Modem80 communications program, Pascal compiler, Assembly Language Development System, Series-I Edtasm, and more. Manuals, books, and magazines. $1200. Send to **Mark S. Halegua,** 66-49 Forest Avenue, Ridgewood, NY 11385. Or call 718-497-2952, evenings after 7PM.

MODEL 16B WITH XENIX $1275

TRS 80 Model 16B with Xenix Operating system, much additional software and 30 day guarantee. **Business Computer Exchange** 202-944-3900.

MODEL FOUR, 128K, LetterQuality Printer, LOTS OF SOFTWARE $1200 **203-777-1476.**

MODEL II Keyboard, (very good) $75. Call Steve, days **718-599-5745.** Shipping extra.

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Radio Shack Model 16/26-6004 or Tandy 6000/26-6021, 2150 printer/26-1272. **305-268-0132,** ask for **Jim.** 5-69

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TRS-80 MODEL 12 new May, 1984 64-K, 2 floppy drives incl. Software & diskettes. $2500. **Junell Alexander,** 111 W. Pine, Deming, NM 88030. 4-66

TRS-80 Model I E/I w/RS 232-C, 1 RS Disk Drive (DD) Modem I, all cables, manuals and large selection of software. $800. **Carolann** 412-486-0197. 6-67

TRS-80 Model 3 Computer - 48K with speed up board and 4 double density drives includes cables. With software and most manuals including DosPlus 3.4, DosPlus 4.0, MultiDos 1.6, NewDos 2.1, TrsDos 1.3 - Operating Systems, Scripsit & Copyart II - Word Processing, TRS-80 Profile Data Base, Maxi Manager B.0 4-drive TRS-80 Payroll, TRS-80 Accounts Payable, TRS-80 Accounts Receivable, Enhanced Visi-Calc. $1195 or Best Offer. Call Gary - **203-937-0106.** 6-67

TRS-80 Model 1 w/monitor, 2-5¼" and 2-8" floppies. 1 Model 1 as above with 3rd 5¼ floppy for parts. Complete. 1 Model 3 with drives. **Manumit** 714-520-0897.

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FREE PROGRAMS! TRS80-co co/ TRS80-III/ TRS80-4/ TRS80-MC10/ TI99-4A/ All Commodores, Timexes. Send stamps! **EZRAEZRA,** Box 5222-PRMY, San Diego, CA 92105.

FREE TRS-80 SOFTWARE. 75 volumes of public domain software for TRS-80 Models I/III/4 in categories of Business, Communications, Education, Games, and Utilities. Send $6 for disk catalog and sample programs. **Fax Plus Computing,** P.O. Box 206, Derry, PA 15627. 4-65

I have like new warranted double sided, 80 track, 96 TPI, half-height Teac 55F 5" drives with 811K storage! For your IBM PC's, Sanyo's, Radio Shack's, or many other systems for $135 each, delivered. **Godfather's Used Computer Syndicate,** P.O. Box 3037, 1154 W. SR 436, Forest City, FL 32714, (305)774-1111 4-65

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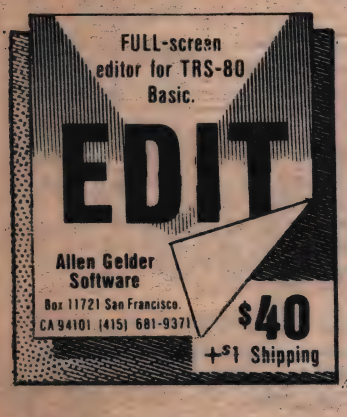

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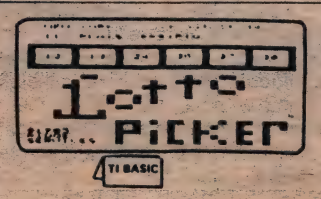

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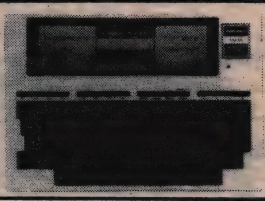

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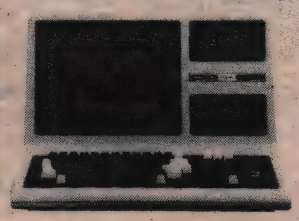

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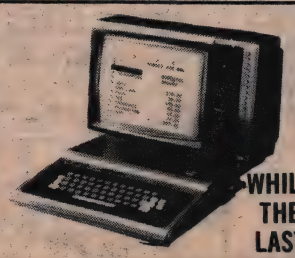

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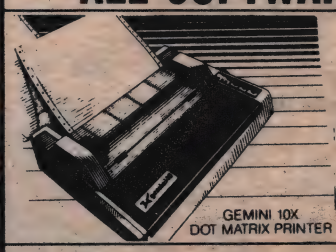

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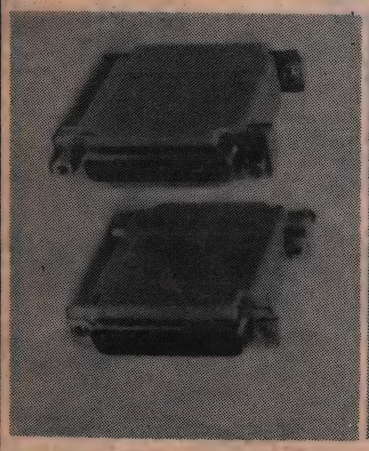

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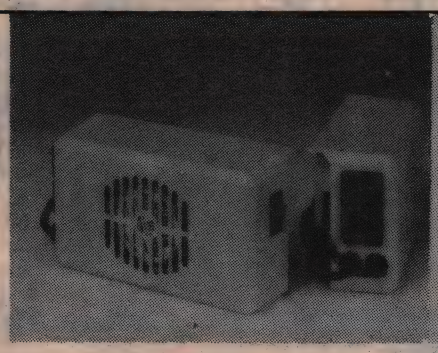

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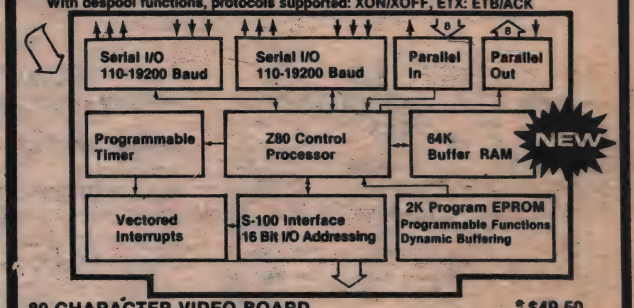

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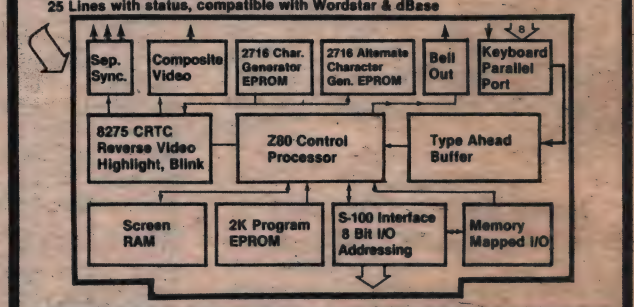

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(129) S-100 COMPUTERS

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10 SLOT S100 boxes with power supply (surplus). Also available with front panel openings for 5¼" FD/HD drives. SASE. **Suntec Computers,** 1523 Eubank NE, Albuquerque, NM 87112, 505-298-0800. 5-65

8" NORTHSTAR System Dual DS/DD Drives Morrow DJ2D CP/M. Hazeltime Terminal **513-878-7595** Before 9 PM. $2200, Amber Monitor $70. 4-65

ALTAIR 8800b, two 8" disk drives, 128K, serial interface, Heath printer, Hazeltine terminal, software, sold "as is," **Louis Abney,** P.O.B. 2305, Auburn, AL 36830 205-887-3908.6-66

CALIFORNIA COMPUTER SYSTEMS. Z-80A, CP/M, 64K, 2-disc drives. 2810 CPU, 2422B floppy controller, 2065 memory board, 12 slot main frame, floppy subsystem uses 2 Shugart SA-801 (SS-8inch) drives. Heath H-19 terminal. Over 80 disks. Ready for printer/modem if you supply 2719 I/O board. Complete documentation. Must sell, going to college! Asking $1100 or make a reasonable offer. **Dave Anderson,** 10268 Bridgett Ct., San Diego, CA 92124. Evenings 619-268-4249.6-66

CCS 2810 and 64K memory board. $200. Excellent condition. **Tom Stokes** 501-427-5425.

COMPLETE S100 system including ALTAIR 8800B 18 slot chasis, TDL ZPU Z80 board, SDS 64K dynamic memory board, TDL system monitor board (2 serial, 1 parallel & cassette I/O ports, Zapple monitor), SDS VDB8024 video card, ITHACA 16K eprom board, SDS Versafloppy disk controller, 8 inch disc with power, cabinet and CP/M, manuals and software for $850. Phone 201-234-4927 evenings and weekends. **Steve Miller,** RD1, Box 502, Pittstown, NJ 08867 3-67

COMPUPRO 8-16C H40 Multi-User System. Runs both 8 and 16 BTT Software simultaneously. 512K

*** HEATH/ZENITH SPOKEN HERE ***

PAYLOAD COMPUTER SERVICES, 15006 SUN HARBOR, HOUSTON, TX 77062

*** PHONE (713) 486-0687 ***

*** ZENITH IBM *** *** COMPATIBLE COMPUTERS *** *** Z-150 SERIES ***

ZF-151-21. One 360K floppy disk drive, 128K RAM, color ready. Retail $2199. Payload.....$1752
ZF-151-52. As above with two floppy disk drives and 320K RAM. Retail $2799. Payload.....$2147
ZW-151-52. As above but with 10.6 MEG Winchester Drive and one floppy disk drive. Retail $4799. Payload.....$3320
ZFA-161-21 PORTABLE. 9" Amber screen, about 33 lbs. All other features same as ZF-151-21. Retail $2399. Payload.....$1883
ZFA-161-52 PORTABLE. 9" Amber screen, two 360K disk drives. All other features same as ZF-151-52. Retail $2999. Payload.....$2280

*** PAYLOAD *** *** ENHANCED ZENITH COMPUTERS ***

Your very best buy in an IBM Compatible. We start with the ZF-151-21 and enhance into a serious computing machine. A PAYLOAD exclusive at prices so low you will wonder how we do it.

PE-151-320-W10 COMPUTER. One Winchester 10.5 MEG Drive, one 360K floppy disk drive, 320K RAM, IBM bus with 3 open slots, color ready.....$2554
PE-151-704-W10 COMPUTER. Same as above but with an incredible 704K RAM installed. Still 3 open IBM slots.....$2748
PE-151-320-W21 COMPUTER. One Winchester 21 MEG (formatted) drive, one 360K floppy disk drive, 320K RAM, IBM bus with 3 open slots, color ready $3021
PE-151-704-W21 COMPUTER. Same as above but with an incredible 704K RAM installed. An unbelievable bargain only from PAYLOAD.....$3215

*** ZENITH LOW PROFILE *** *** COMPUTERS, Z-100 SERIES ***

ZF-100-31. Single 320K disk drive, 192K RAM. Color RAM set required for color. Retail $3029. Payload $2479
ZF-111-22. Two 320K disk drives, color graphics, 128K RAM. Retail $3499. Payload.....$2807
ZW-111-32. Internal 11 MEG Winchester hard disk drive, one 320K disk drive, color graphics, 192K RAM. Retail $5499. Payload.....$4172

*** ZENITH ALL-IN-ONE-COMPUTERS *** *** Z-100 SERIES ***

ZF-121-32. Two 320K disk drives, 192K RAM, monitor built in. Retail $3729. Payload.....$2905
ZW-121-32. Internal 11 MEG Winchester hard disk drive, one 320K disk drive, 192K RAM, monitor built in. Retail $5599. Payload.....$4228

*** ZENITH MONITORS ***

ZVM-136. Long persistance 13" high res.....$656
ZVM-135. Color 13" high res., RGB & Composite $493
VZM-133. Color 13" high res., RGB only.....$447
CV-2562. Color 25" high res., RGB & Composite $726
ZVM-122. Amber 12". List $170.....$115
ZVM-122A. Amber non-glare 12".....$119
ZVM-123. Green 12". List $150.....$108
ZVM-123A. Green Non-glare 12".....$119

*** UPGRADE ACCESSORIES *** *** FOR Z-150/160 SERIES COMPUTERS ***

MEMORY UPGRADE KITS with easy to follow instructions.
MEMORY KIT #150-64-9. Each kit will increase memory by 64K up to 320K. Only the finest 150 NS RAM chips included.....$26
MEMORY KIT #150-256-18. Includes a ZPAL chip which allows use of the new 256K RAM chips included (18 pieces 256K 150 NS RAM chips). Kit increases 128K memory to 640K. If you have over 128K now, will go up to 704K. All plug into your single Zenith Memory Board. Unbelievable but true.....$194
Winchester Hard Disk Drive Internal Set-Up. Includes Winchester drive, controller/interface card, cables and all hardware. With 10.5 MEG (formatted) drive $802. With 21.0 MEG (formatted) drive.....$1239
Winchester Hard Disk Drive External Set-up. Includes Winchester drive, controller/interface card, power supply and case with fan. With 10.5 MEG (formatted) drive $1049. With 21.0 MEG (formatted) drive.....$1486
Z-316. 8087 Numeric co-processor. Speeds and improves numeric processing. Retail $225. Payload price.....$194
Z-319 High Resolution Video Card. Emulates Z-100 series computers 640 by 225 pixel-mapped graphics. Retail $499. Payload price.....$442
SECOND INTERNAL DISK DRIVE. Includes instructions and all mounting hardware. If you have a Shugart drive (has rotating lever latch) $147. IF your drive is a Mitsubishi (has flat up/down latch).....$175

*** UPGRADE ACCESSORIES *** *** FOR Z-100 SERIES COMPUTERS ***

COLOR GRAPHICS UPGRADE. All memory chips (16 pieces 150 NS) required to update Z-100 series computer for color. Installation instructions included. Order memory kit #100-64-16.....$46.50 **Complete**
MEMORY UPGRADE. All memory chips (9 pieces 150 NS) required to upgrade from 128K to 192K RAM. Installation instructions included. Order Memory Kit #100-64-9.....$26
UCI MEMORY UPGRADE CARD. We recommend this one highly. The board has 72 sockets for eight banks of either 64K or 256K memory chips (Dynamic RAM). Board (no RAM) $455, with 256K (64K chips) installed $555. With 256K chips installed: 512K for $611, 1.0 MEG for $767, 1.5 MEG for $923, 2.0 MEG for $1079
UCI Z-100 SPEED MODULE. Run your Z-100 computer at 8.0 MHz. Installs easily with no soldering. Externally switchable between speed and normal mode. Five replacement chips are included to insure correct function.....$48
Z-216. 8087 Numeric Co-Processor speeds and improves numeric processing. Retail $379. Payload price.....$325
Winchester Hard Disk Drive External Set-up. Includes Winchester drive, Zenith interface card, data separator, power supply/case with fan, cables. Computer must have power supply with connector for Winchester controller. With 10.5 MEG (formatted) drive $1477. With 21.0 MEG (formatted) drive.....$1914
Winchester Hard Disk Drives Internal Set-up. Includes all items above less power supply/case. Computer must have power supply with connector for Winchester controller. With 10.5 MEG (formatted) drive $1247. With 21.0 MEG (formatted)d rive.....$1684

*** UPGRADE ACCESSORIES *** *** FOR H/Z-89 COMPUTERS ***

Magnolia Microsystems Double Density Controller. Soft-sectored disk controller. Supports up to four each 5.25" and 8" disk drives. Complete with cables, installation instructions and CP/M 2.242.....$354
Magnolia Microsystems 128K RAM Board. Add to your 48K H/Z-89 CPU memory for a total of 176K. Includes CP/M plus (CP/M 3.0), a $350 value, at no additional charge. Payload price.....$446
Magnolia Microsystems Memory Upgrade Card. Installs in your H-89 to increase memory from 48K to 64K. Payload price.....$68.50
Magnolia Microsystems SASI Bus I/O. Use to connect Winchester disk drives to your H-89. Also has three Serial Ports. Software included. Payload.....$225
Winchester Hard Disk Drive Set-up. Includes hard disk drive, SASE Interface (above), power supply and case with fan, cables, hard disk controller and CP/M software. $1122 for 10.5 MEG (formatted) set-up or for 21.0 MEG set-up.....$1559

*** INTERNAL DUAL DRIVE SETUPS *** *** FOR THE H/Z-89 COMPUTER ***

Includes two half height double sided disk drives and all hardware and connectors required to mount inside your H-89. Steel mounting shield/case included.

NATIONAL JA551-2 Setup, 48 TPI, 6 MS seek, 320K disks.....$333
MITSUBISHI 4851 Setup, 48 TPI, 6 MS seek, 320K disks.....$389
MITSUBISHI 4853 Setup, 96 TPI, 3 MS seek, 640K disks.....$389

*** EXTERNAL DUAL DRIVE SETUPS *** *** FOR ALL ZENITH COMPUTERS ***

Includes two half height double sided disk drives mounted in a deluxe case with power supply. Cable included.

NATIONAL JA551-2 Setup, 48 TPI, 6 MS seek, 320K disks.....$367
MITSUBISHI 4851 Setup, 48 TPI, 6 MS seek, 320K disks.....$416
MITSUBISHI 4853 Setup, 96 TPI, 3 MS seek, 640K disks.....$416

*** HALF HEIGHT DISK DRIVES ***

TANDON TM848-2E 8" DS, DD, 48 TPI.....$395
MITSUBISHI M2896 8" DS, DD, 48 TPI.....$395
NATIONAL JA551-2 5.25" DS, DD, 48 TPI.....$144
MITSUBISHI M4851 5.25" DS, DD, 48 TPI.....$172
MITSUBISHI M4853 5.25" DS, DD, 96 TPI.....$172

*** EIGHT INCH DISK DRIVE SYSTEM ***

Two Tandon or Mitsubishi (your choice) 8" half-height, double density, double sided drives in deluxe cabinet with heavy duty power supply with cooling fan, 2.4 MEG storage total. Plug into H/Z-89 equipped with Magnolia DD controller or any H/Z-100 computer. PAYLOAD.....$1027

*** POWER SUPPLIES AND CASES *** *** FOR DISK DRIVES ***

Rugged steel construction with heavy duty power supplies. Purchase with drives and we will install drives in case.

Single 5.25" unit for full height drive.....$68
Dual 5.25" unit, specify full or half height.....$92
Dual 8" unit with fan, for half height drives.....$225
Face plate for single drive in dual case.....$8
For WINCHESTER drive, with fan.....$225

*** MEMOREX DISKS ***

These are the disks we use at PAYLOAD, top of the line and reasonably priced. Prices are NET postpaid. No other charges for disk only orders.

#3481 5¼" SS/DD soft sector...$24.70 Box of 10
#3483 5¼" SS/DD 10 hard sector $24.70 Box of 10
#3491 5¼" DS/DD soft sector..$32.10 Box of 10
#3493 5¼" DS/DD 10 hard sector $32.10 Box of 10
#3501 5¼" DS/DD soft sector 96 TPI $41.10 Box of 10
#3062 8" SS/SD soft sector.....$27.90 Box of 10
#3102 8" DS/DD soft sector....$38.40 Box of 10

*** RAM CHIP SPECIALS ***

The finest available and at PAYLOAD prices. Order one to one thousand and add only $2 for shipping.

64K Dynamic RAM, 150 NS.....$2.91 each
256K Dynamic RAM, 150 NS.....$8.67 each

*** HAYES MODEMS ***

SMARTMODEM 300 Baud.....$245
SMARTMODEM 1200 300/1200 Baud.....$477
SMARTCOM II Software for IBM or Zenith 150 $124
HAYES CHRONOGRAPH Clock/Calendar (serial) $224

*** TOSHIBA PRINTERS ***

The new generation printers are here. The Toshiba 3-in-1 printers offer high speed draft quality, near letter quality and high-resolution graphics using an advanced 24 pin dot matrix print head. Choice of serial or parallel interface.

P-1340 10" carriage, 144/54 CPS, parallel or serial $649
P-351 (Improved P-1351) 15" carriage, 160/100 CPS:
Parallel only.....$1338
Parallel and Serial.....$1367

*** C.ITOH DOT MATRIX PRINTERS ***

PROWRITER 8510-AP. 10" carriage, 120 CPS, correspondence quality matrix. Tractor and friction feed. Parallel interface.....$356
PROWRITER 8510-BC2. Same as above but serial interface.....$458
PROWRITER/2 Model 1550P. Same as 8510-AP but 15" carriage.....$474
PROWRITER/2 Model 1550BCD. Same as above but serial interface.....$522

*** C.ITOH LETTER QUALITY PRINTERS ***

STARWRITER A10-20S. Daisy Wheel, 29 CPS. 13" carriage. Order parallel or serial interface. Retail price $669. PAYLOAD Price only.....$528
STARWRITER F10-40. Daisy Wheel, 40 CPS. 15" carriage. Order parallel or serial interface. Retail price $1199. PAYLOAD Price only.....$909
OPTIONAL BI-DIRECTIONAL TRACTOR FEED for STARWRITER. For A-10 $164, for F-10.....$184
SINGLE SHEET FEEDER for STARWRITER. Retail $399. PAYLOAD.....$277

PAYLOAD COMPUTER SERVICES

Your satisfaction is guaranteed. All hardware carries a 90 day warranty. Prices listed have been discounted for payment with order. VISA and MASTERCARD orders please add 3%. Add $5.00 to all prepaid orders for handling and shipping, we pay the balance. Actual shipping costs billed for net billing orders to approved accounts. Call us, we will be happy to answer your questions. THANK YOU.

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HOUSTON, TEXAS 77062
PHONE (713) 486-0687

RAM, 40 Mb Hard Disk, 8" DD, 512K RAM-Disk, 3 QUME Terminals, Modem, MP/M 8-16 Operating System. Runs CP/M-80 and CP/M-86 simultaneously. WORDSTAR, dBASEII, SUPERCALC II, Communications Software, and more. **John Hobbs,** 19 Sanford St., East Longmeadow, MA 01028 413-733-7122. 6-66

COMPUPRO Z-80 computer system. Includes CPU, 64K CMOS RAM, DISK-1 FDC, 2 Parallel, 2 serial I/O, 8" DSDD floppy and 5 MB Winchester. Also contains Hayes Micromodem-100 auto-dial/answer modem. All original disks and documentation. Buy entire system and receive $1000 in software included. (CPM 2.2, UCSD P-system, MITE communication package, Z80 MASM/LINK, NEVADA FORTRAN, EDIT, PASCAL, Microsoft MULTIPLAN) Unbelievable at $3800. Add terminal and printer for complete system. (over $6000 new). Also, Cromemco 4FDC $100, 32K RAM $50, Centronics 306 printer $100, INFOTON Vistar terminal $100, dual 8" floppy disk cabinet s/PS $75, 2- 8" DSDD drives (SHUGART, needs head alignment) $100/pair. Contact A. Lassiter 6 pm MST **505-266-6526.** 5-65

COMPUPRO Z80B SYSTEM, Dual 8" SSDD Shugart Drives, PMMI S-100 Modem, much software, terminal not included. **Works Perfectly.** Asking $1800. **Richard Rockwell,** 1400 Crestmont Drive, Angwin, California, 94508. 707-965-2976.

CROMEMCO SCC(2) Single Card Computer boards working? $75 both **408-287-2961** CA.

CROMEMCO Z2H, 11 meg hard dis, 128k, Cromix, line printer, letter printer, 3100 terminal, best offer. **Joe 405-733-1683** 4-65

Cromemco Computer boards at appx. 75% off list prices call for quotes. We have in stock 64KZ, 64KZ II, Tu-Art, WDI-II, 4FDC, 16FDC, 64FDC, ZPU, ZPUII, PRI, Dazzler, Quadart, SDIV, 16KZ, DPU, MCU. MSU512, MCU, VPU, STDC, CNI, GPIB, 48KTP, SCC. **CEC,** 415-342-4058, P.O. Box 1965, Burlingame, Calif. 94010. 6-66

DUAL sys 83/20 Plus 20 with AT&T Unix version 7 operating system. This system is multiuser, 68000 based 10mhz CPU. Supports 8 users, 40 meg of hard drive storage. Many extras must sell cost 18,000 last year. Willing to sell for just $10,000 call for more info **309-764-4344** ext. 219. Ask for Greg 7:30-3:00. 5-66

Expander, S-100 4 slots w/power supply, RS232, parallel, cassette I/O, 80x24 screen $125. **S-100 64K** memory board. Easy set-up. $120. Parts for Expander S-100, offer. **Power supply** for S-100 system in box $29. **John Kolmar,** 418 W. Hackberry Dr., Arlington Hts., IL 60004 312-253-2513 after 5:00 p.m.

Explorer-85 8085, 48K+, 8K Basic, keyboard, case, fan. Levels A-E fully operational. Asking $300. **Marcus Albro,** P.O. Box 1534, Poulsbo, WA 98370.

GOLD! - Recover pure gold from old scrap circuit boards, electronics, etc. Very easy. My book tells how. Send $25. **J. Sciuto,** Box 129, Methuen, MASS 01844. 5-75

IMSAI VDP-40 drives, monitor, keyboard, 32KB, MPU-B, VIO, MDIO, Super Sort, CBasic. Best offer takes all or parts **305-495-1923.** 6-66

IMS MULTI-USER COMPUTER, with 4 terminals, and IMS software, 20 Meg. hard disk, one year old asking $6,500 obo. Write or call **Gilfillan Engineering,** P.O. Box 871868, Wasilla, Alaska, 99687 907-376-3005. 6-68

Ithica InterSystems Boards, 64K Memory $100, 256K Memory $400, Disk Cnt. $225, MPU-80 $150, VIO $150, A/D $150. Frontenac Designs **607-387-5303.** 5-65

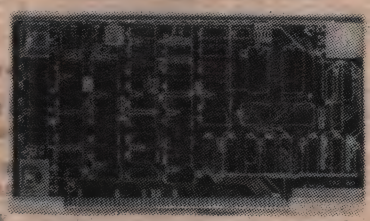
LOMAS 8086/8089 CPM $340, LDPF2 disk controller $150, Hazitall I/O board $200, Integrand 800 DB2F mainframe $350, Compupro RAM 16 $200 (2), all above with 2 Qume 242 8" floppies for $1950. All items like new. 301-587-1799, **Russ Hersch,** 8600 16th St., 1002, Silver Spring, MD 20910.

MICROMATION BACKPLANE

Shielded & terminated. Ground trace between each pair of signal traces, active termination for operation well above 30MHz. Includes fused supply lines. Finest S-100 Bus design line we have seen! Bare board (ltd. qty.) $19. Complete, assembled $99. **Computer Parts Mart,** 415-493-5930.

S-100 Intergrand DB800 Cabinet, power supply and 10 slot card cage $350, S-100 CCS cards, 2810 CPU $175, CCS 2422 controller $275, CCS 2719 4 serial port $275, Artec 32K cards $85, Godblout terminator card $25 plus shipping on all above **216-233-8636** after 5 EDT.

S.S.M. S-100 Z-80 CPU



Bare, unpopulated "CB-2" board. I-EEE-696 card. Features: extended address (24 bits), up to 8K prom/ram (22 sockets) jump on reset, 2/4MHz. Board & manual $24.95 & shipping. **Computer Parts Mart,** 3200 Park Blvd., Palo Alto, CA 94306. 415-493-5930.

WANTED

CCS 2810, 2422, 2065 boards, 2200 mainframes, or systems consisting of same. Call Art **312-736-7667.5-66**

(130) S-100 COMPATIBLE, PERIPHERAL

(6) COMPUPRO Interfacer 1 BDS. Asking $50 ea. (4) 20 meg Fujitsu 8" hard drives complete under warranty, asking $1400 ea. Call **309-764-4344** ext. 219. Ask for Greg. 5-66

CP/M User Group Software now available on rental! Send for our Directory disk, just $5 pp. or a SASE to **National Public Domain,** 1533 Avohill, Vista, CA 92083. 6-70

FOR SALE, WAMECO FDC-1 disk controller-$50, SSM VB1A 64x16 Video-$25, CCS Model XVI 16K RAM-$50, used Vector 8800V prototype card-$8. Add-post-AP, P.O. Box 1752, Clemson, SC 29631, **803-882-7201.** 5-65

(131) S-50 COMPATIBLE, PERIPHERAL

(132) HEATH COMPUTERS FOR SALE

8" Shugart ½ height SSDD MOD SA 810-1 mint condition with 1 full year warranty. These drives do not require AC, track to track access time is 3ms. Capacity is 800KB. $269. **CEC** 415-342-4058, P.O. Box 1965, Burlingame, Calif. 94010.6-66

H-89 Computer 64KB green CRT with CPM SuperCalc $550. **Russ** 518-872-2538.

Heath H-8 computer. 64K. Two H-17 disk drives. Four serial ports. Hazeltine 1500 terminal. Much software. $800. G. Horowitz, 23-38 37th St., Queens, NY 11105. **718-204-5817.** 5-65

Heath Z90 has 64K 2D.S. Soft Sector internal drives, one hard sectored external drive. Okidata 92 printer. CP/M, MBasic, Fortran, Perfect Writer, Perfect Speller. All documentation. $1400. Phone **716-822-4267.** 6-67

MPI MOD 51S SSDD Unused drives in factory boxes $88. **CEC,** 415-342-4058, P.O. Box 1965, Burlingame, Calif. 94010. 6-66

Z-100 WINCHESTER, ZW-111-32, 192K, Color, Z-DOS, Guaranteed, Like New $4000, **Microcomputer Services** 314-471-9229. 4-65

Zenith Z-110, Two DSDD Drives, Monitor, 192K RAM, Complete Color Graphics Video. RAM, CP/M-85, Z-DOS, ZBASIC, Manuals, Dust Cover. Current Retail is $4128.95, sell for ONLY $2000. Call Dave **315-732-8448.**

(132A) HEATH, SOFTWARE, PERIPHERAL

PIP - Parts Inventory Program. All H/Z Formats. Fully Menu-Driven. Updates. Reports. Searches. Automatic Features. MORE!! $49.95 or send SASE + $1 for Manual. **ABE DWECK PROGRAMS,** POB 207, Carmel, NY 10512. 3-67

USED SOFTWARE for H/Z-100. Lotus 1-2-3 $85. dbase 11 $85. Wordstar 3.3 with mailmerge $100. Condor DBMS $85. PeachTree 5000 $85. Z-Basic $85. Z-Basic compiler $85. Cobol $85. Multiplan $75. Z-chart $45. Additional programs available, call for list. Joe at **505-266-2344.5-69**

Z/H-100 Software - utilities, games, spreadsheets, word processors, Public Domain, modem packages, computed aided design, much more. Send a SASE for huge list to **Total Computer Supply,** P.O. Box 26800, Suite 225, Albuquerque, NM 87106. 6-68

(133) BURROUGHS SYSTEMS

B-21-4T MICROCOMPUTER 256K, 5MB drive, 2 serial ports, 1 parallel port, as is. $3250 or make offer. Send address, and phone number to MIS, P.O. Box 2052, FALLS CHURCH, VA 22042, PHONE **703-569-0708.** 5-66

(134) HEWLETT PACKARD COMPUTERS FOR SALE

A VARIETY of H.P. equipment at good prices. **The Buto Brokers,** The Sacramento Valley's Used Computer Store, (916)334-BYTE. 3-65

HP-110 Portable or HP-150A with touchscreen $2295.00 with factory warranty. Call Randy at **919-752-8072,** System Distributing, 223 W. 10th St. Suite 137, Greenville, NC 27834.

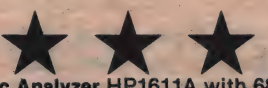
HP150B with HP 9133 XV Hard Disk and Software. Mint Condition. Send SASE for inventory list. **CLASSEN,** 2230 Dandridge, York, PA 17403 717-741-1689. 6-66

HP 41C with mathematics, finance modules. All excellent, $15 P.P. **16C** (decimal, octal, hex) excellent, $65 P.P. Trades: software for Compaq. **Roberts,** Box 1565, So. Hackensack, NJ 07606. 6-66

HP86A Computer 12" Monitor, two 5¼" disk drives, 192K Memory, Roms, Graphics printers, and more. $2495, Phone **(303) 669-2535** after 4:00 PM (MST) 4-65

HP86A two 5¼" disc drives, printer, CPM module, monitor, 2 sets Peachtree Software, all instruction manuals. $2600 Call Sandy **208-344-1172** Boise, Idaho. Hardly used. 6-66

HP-86B 128K, 2 ea. 5" drives, 12" green monitor #82913A, 80 Col. Printer, word 80, file 80 Visicalc+, & Utilities, $2400 with warranty. **Godfather's Used Computer Syndicate,** P.O. Box 3037, 1154 W. SR 436, Forest City, FL 32714, (305)774-1111 4-65



Logic Analyzer HP1611A with 6809 module. A must for code debugging. $3000. **303-530-1600,** 303-651-9402 Robert. 6-66

(134A) HEWLETT PACKARD COMPUTERS WANTED

Data Communications software, printer plotter software, printer, plotter, RS232, Roms paper all for HP-85. Ph **815-968-4060.**

I Buy, Sell & Trade Hewlett Packard Computers. **Godfather's Used Computer Syndicate,** P.O. Box 3037, 1154 W. SR 436, Forest City, FL 32714, (305)774-1111 4-65

WANTED: Single disc drive, 64K memory, I/O ROM, modem for HP-87 have 16K memory and lots of software for HP-85, HP-125. 313-528-1571 or write **Terry Bannerton,** P.O. Box 1034, Troy, Mich. 48099. 5-65

(134B) HEWLETT PACKARD SOFTWARE, PERIPH.

HP THINKJET Printer (2225A) $350. HP Double Disc Drive (9121D) With 20+ Discs $650 (9 months of light use). Call **517-783-4255.** Postpaid. 4-65

(136) DATA GENERAL SYSTEMS

2 Complete Data General Nova3 with Interfaces memory and controllers. 5 meg removable hard disk. From working system. With tape interface. All for $1300. **Gene.** 914-337-7230.

HP 41C with mathematics, finance modules. All excellent, $155 PP. **16C** (decimal, octal, hex) excellent, $65 PP. Trades: software for compag. **Roberts,** Box 1565, So. Hackensack, NJ 07606. 6-66

(138) DATA GENERAL, SOFTWARE PERIPH.

(142) DATAPOINT SYSTEMS

(144) DATAPOINT SOFTWARE PERIPHERAL

(148) DEC SYSTEMS FOR SALE

DECMATEII Complete. LA-50 printer. 10-MB. Hard disc. Never used. 30% off list. Will separate. Don **603-542-9637** evenings. 5-65

DEC RAINBOW 256K with Dual 400K Disks, Like New $1300. **609-924-2189.** 5-65

DEC RP04-AA 88MB removable platter disk drive. With LP04-H unit select switch, PDP-11 interface cards and cabling. Very good condition (under DEC service contract) $2400. Memory boards also available. Call **Nick** 312-255-5092.

MICRO PDP 11/23 + S COMPLETE SYSTEMS $7449

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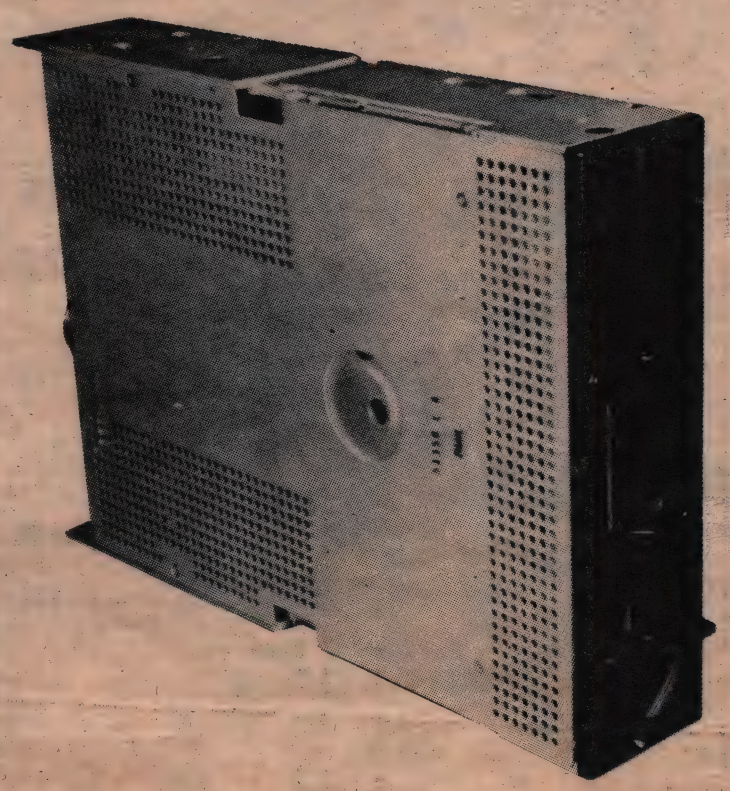

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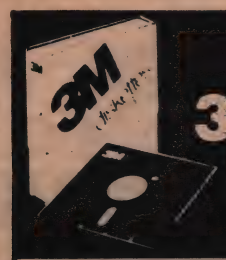

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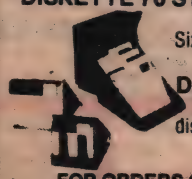

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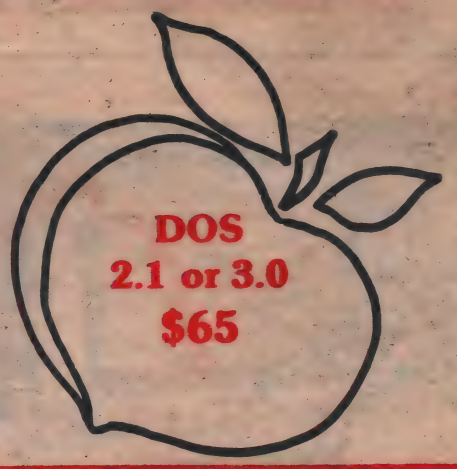

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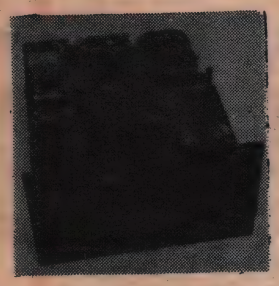

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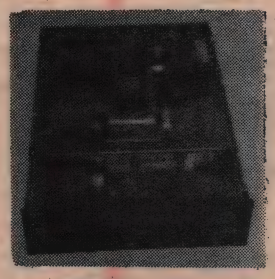

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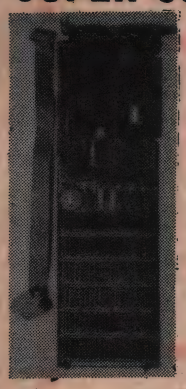

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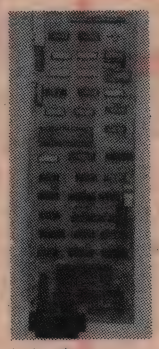

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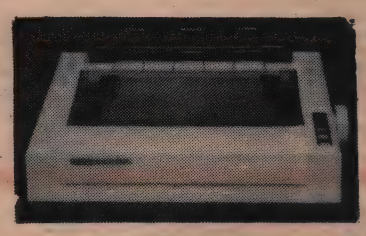

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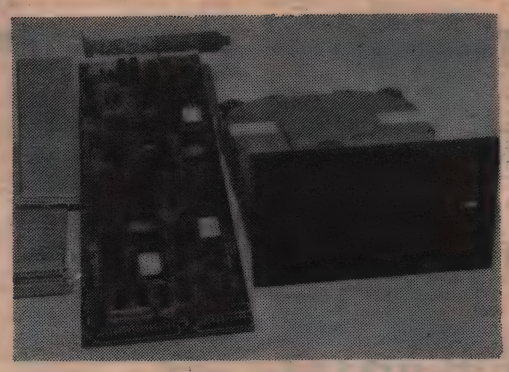

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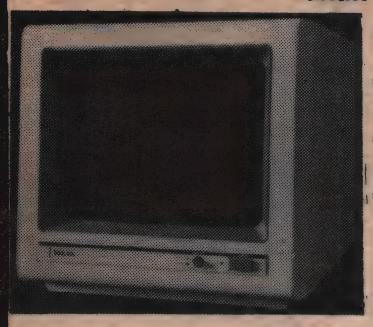

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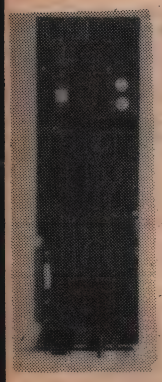

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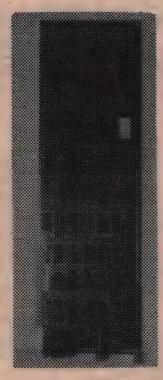

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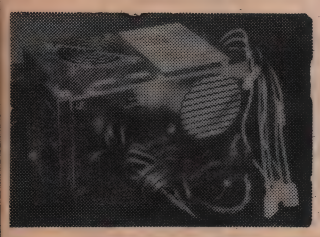

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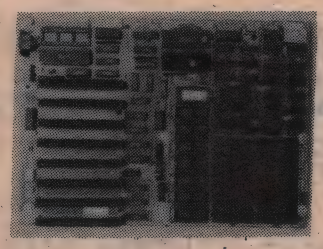

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* Swivel monitor stand	$12

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Prices subject to change without notice.
California residents add 6.5% tax.

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TO SERVICE I.B.M. PCs & COMPATIBLE THE THOMAS 9 DIAGNOSTIC BOARD

Is a must to save you time on checking and servicing I.B.M. PC and compatibles

By sliding THOMAS 9 DIAGNOSTIC BOARD into any I.B.M. PC or compatible mother board you get:

* Access to all 62 terminals on the clear side of the board to hook up an ocilloscope to measure signals or voltages.
* At a glance LEDs matrix indicate the status on all voltages.
* LEDs matrix indicate if any voltage is 5% lower or higher.
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BE AHEAD OF EVERYBODY ELSE, ORDER NOW.
Distribution is based on first come first serve basis.
THOMAS 9 DIAGNOSTIC BOARD comes complete with full instructions on how to use it.

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ORDER DATE

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COMPANY:_____ TEL # ( )_____

ADDRESS:_____

Street & # City_____

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THOMAS 9 QUANTITY ORDERED:_____

AMOUNT ATTACHED:_____

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APPLE IIE DETACHED KEYBOARD

A GEM of a keyboard, in a nice beige ABS case. Lets you build an IBM look-a-like that runs like a IIE with 2 drives in case using our $69.95 case on this page. This KB is fully IIE compatible, with all functions **$149.95**

6502 MOTHER BOARD

$29.95

The famous PARTS GALORE 6502 motherboard that is 100% compatible with upper/lower case, 74LS245 octal buffer (rev-8+), prototype area, and uses EPROMS for all BASIC or boot-to-disc software. (3-2732 or 6-2716 for basic). Still only from us at $29.95
UPPER/LOWER Case char. gen. (2716) $9.95

ASCII KEYBOARD

Our new ASCII keyboard is the best one we have ever had!!! It uses an 8048 5V only microprocessor packed with features like: AUTOREPEAT, UPPER/LOWER CASE, APPLE® , CPM® and BASIC stored macros(88) that allow single stroke entry of many commands like, "CATALOG" "DIR" "RUN" and so on for 88 of them with complete documentation.
NUMERIC Function Keyboard $69.95
STANDARD (Like orig. APPLE) Function Keyboard $64.95

KITS KITS KITS FOR 6502 BARE PERIPHERAL CARDS

These kits have all the parts needed for the PCB in question but have no IC's. Please get IC's from BG MICRO or JDR MICRODEVICES as they are reputable, low cost and fast. They advertise in the SHOPPER.

16K Solderable parts kit $13.95
128K Solderable parts kit $18.95
ROM Solderable parts kit $9.95
DISC Solderable parts kit $11.95
DISC 13/16 Solderable parts kit $13.95
DISC Rana Solderable parts kit $24.95
80 Column Solderable parts kit $16.95
80 Col. SS Solderable parts kit $18.95
Z-80 Solderable parts kit $13.95
APPLACARD Solderable parts kit $39.95
Multifunction Solderable parts kit $39.95
RS-232 Solderable parts kit $14.95
Comm. Solderable parts kit $14.95
MODEM Solderable parts kit $39.95
SAM Solderable parts kit $8.95
COPYCARD Solderable parts kit $8.95
TIME II Solderable parts kit $16.95
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GRAPHICS Dump Printer Solderable parts kit $12.95
SPRITE Solderable parts kit $14.95
SPRITE, Manual, software listing and disc $14.95

NEW EXPANDED 80 COLUMN FOR THE APPLE IIe

This bare PCB allows you to expand your IIe to 128K and get the enhanced 80 column feature in it. It is a real winner and easy to build. We sell it as a bare PCB or wired and tested.

Wired and tested, EXP 80 column board $99.00
BARE PCB, EXP 80 column board $19.95

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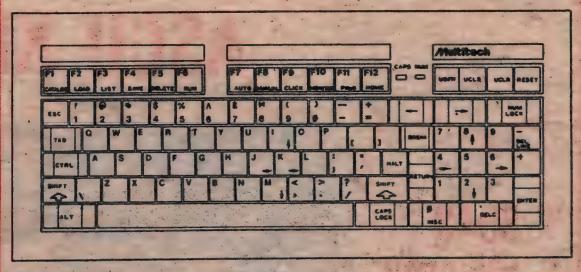
TERMS: Minimum order is $10. For orders less than $60 add $5 shipping & handling for UPS Ground delivery or $10 for UPS 2nd day air. Orders over $60, add 5% for shipping & handling for UPS ground, 10% for 2nd day air. COD orders add $2.50 to above fees. New York residents add proper sales tax. COD payment must be cash, certified check or money order. Phone and mail orders can pay by Visa, MasterCard, Amex. or COD. We accept personal checks with mail orders, but allow two extra weeks for processing.

MAK II ACCUFEEL KEYBOARD



This is a detached keyboard in an ABS case with a 6' curly cord to connect it to 6502 based machines. It used a serial data format for error free transmissions down the curly cord with a serial to parallel converter board on the end that is fully 6502/Apple compatible. Has auto repeat, beep, no beep, 10 user programmable macros, 50 preprogrammed macros, auto line number, an dnumeric pad $149.95

FRANKLIN COMPATIBLE

APPLE® BARE PC BOARDS PRICE SLASH! NEW LOWER PRICES

16K Memory exp CPM® compatible $9.95
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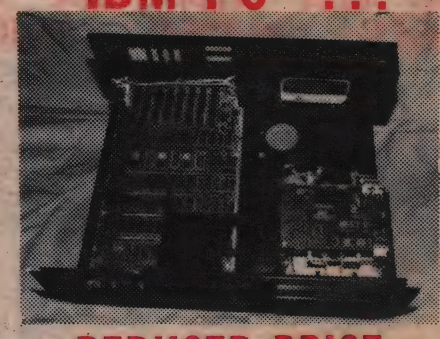
DISC control, std. stype ½ drives $9.95
DISC control, 13/16 sector auto select, 2 Dr. $9.95
DISC control, 4 drive RANA4 compatible $9.95
80 column 100% Videx® compatible $9.95
80 column 100% Videx® comp, with softswitch $12
Z-80, the famous CPM® card $9.95
APPLACARD, Z-80 plus 64K on board $15
MULTIFUNCTION Card, Mountain compatible $15
RS-232 Serial printer card $9.95
Communications Card, serial dat for modem $9.95
MODEM card, SSM® compatible $14.95
SAM Talking card $9.95
COPYING card, WILDCARD® compatible $9.95
TIME card, TIME II® compatible $9.95
MUSIC Card, 9 voice, G1 chip $9.95
GRAPHIC Dump Printer card, Grappier® comp. $12
SPRITE Graphics card, for TI chip $9.95
PROTOTYPE Large $15
PROTOTYPE Small $12
RGB CARD, has all outputs for TTL RGB monitors $18.95
MAPPING PROM for RGB card $9.95

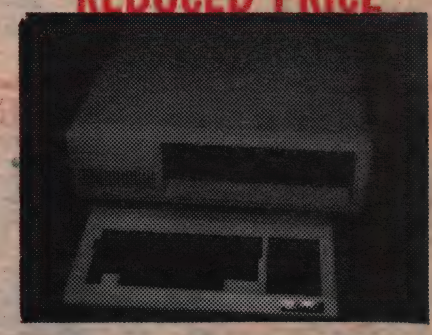
All of these bare PCB's come witha parts list and placement diagram. In some cases you will also need software/firmware to operate these cards. This must be composed or found from a users group, we will not supply it.

The famous APPLE-SEED and APPLE-SEED II are the books that see all, tell all on the various APPLE® clone motherboards and peripherals. They are well worth the $9.95 that we are asking. And KOSMIC has been at it again on IBM® clone motherboards and peripherals and has composed the one and only "BIG BLUE SEED", it goes into greater detail on a smaller number of motherboards and peripherals (over 20 and growing) and will help you to build many of them at a saving.
APPLE-SEED I Motherboard book $9.95
APPLE-SEED II Peripheral card book (over 50 cards) $9.95
BIG BLUE SEED IBM® peripherals and motherboards (over 20) $12.95

IBM PC™ ???



REDUCED PRICE



No, not really, but it is a good look-a-like case for IBM PCB builders or 6502 PCB builders. Both PCB's fit inside and the unit has space for a power supply, fan and 2 std or 4 slimline disc drives. NOW ONLY **$69.95**

HEAVY DUTY POWER SUPPLY $64.95

Our Black Beauty power supply has true specs of 5v at 5 Amp, 12v at 2.5 Amp and −5, −12 at ½ Amp. Each of the +5 or +12 can run at 30% overcurrent for short periods. Has proper sequenced startup and shutdown. Easily runs 2 disc drives and a full set of peripherals.

HARD TO GET 6502 PARTS

14.318 MHZ Xtal ..... $2.49 ea.
17.43 MHZ Xtal ..... $2.95 ea.
4.032 MHZ Xtal (MODEM) $3.95 ea.
MPSA13 transistor ..... $.69 ea.
2N3904 transistor ..... $.65 ea.
2N4258 transistor ..... $.65 ea.
50 pf trimcap ..... $1 ea.
2716 (BLANK) ..... $4.95 ea.
Header pin set ..... $.49 ea.
2.3" Speaker, 8 ohm .. $1.50 ea.
Speaker connector ..... $.40 ea.
0.02 Uf Disc cap ..... $.20 ea.
All the ¼ W resistors $1.75 all
All the IC sockets ..... $18 all
Edge Connectors (8) .. $2.35 ea.
27 Microhenry coil ..... $1 ea.
1K X 8 SIP (3) ..... $.80 ea.
10K X 9 SIP (Z-80) ... $.90 ea.
220 ohm trimpot ..... $.49 ea.
Inline power jack ..... $1.29 ea.
Character generator .. $9.95 ea.
2732 (BLANK) ..... $9 ea.
RCA Rt. angle jack ..... $1 ea.
Audio In Out jacks .... $.50 ea.
47pf Disc cap ..... $.20 ea.
0.1Uf Monolithic cap .. $.15 ea.
1N914 Diode ..... $.10 ea.

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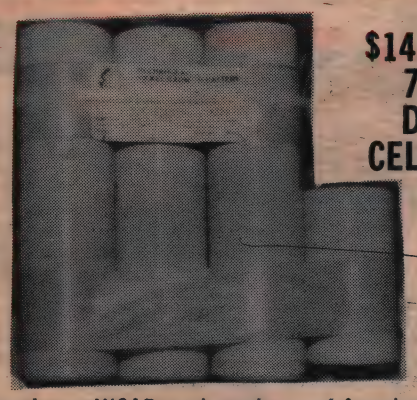
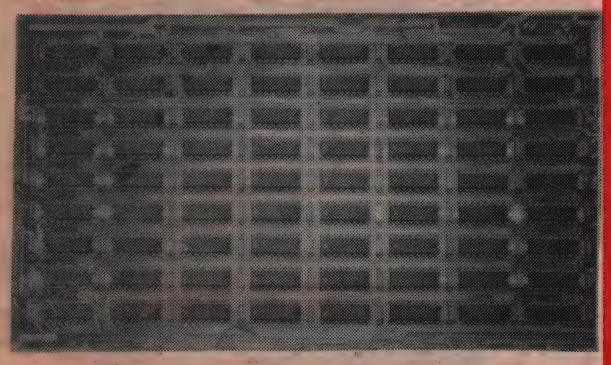
NICAD PACK
8.2V — 4 AMP HOUR



$14.95
7
D
CELLS

A brand new NICAD pack made up of American NICADS by GE. Each pack has 7 cells at 1.2 volts each. Full D sized and rated at 4 Amp hours this is a very good value. Consider the price of D cells at retail for $5-$6 each and you will agree they are cheap at $14.95

4164 4164 4164 4164 4164
RAMDEAL RAMDEAL RAMDEAL

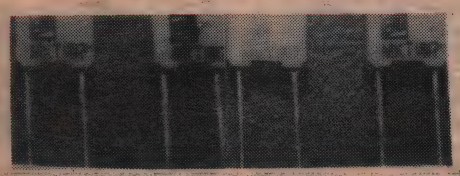


ASCII AND MATRIX KEYBOARDS

We just bought a bunch of new surplus keyboards, they are two types. One uses the KR2376 keyboard encoder IC and the other is a matrix type, like the APPLE IIE. Each KB has a full set of keys as pictured and each one has all its constituent parts. We have only a few hundred of each so first come first served. The KR2376 alone is worth what we are asking. Please specify the type you want. They are $9.95 each or three for $20.00, Mix or Match. We regret we have no data on these keyboards.

$9.95 — 3/$20.00

0.1 MONOLITHIC STYLE CAPACITORS



Here is a good value on 0.1 Uf 63V bypass caps. They are as pictured, 0.2" lead spacing with 3/4" long leads. We have 100,000 of them at a very good price. We are selling a bakers dozen for $1.00 = 13 pcs. If you want 100, send us $7.00, 1000 are $60.00.

SWITCHING
POWER SUPPLY

SMALL SIZE, 75% EFFICIENCY 4" x 7.75"

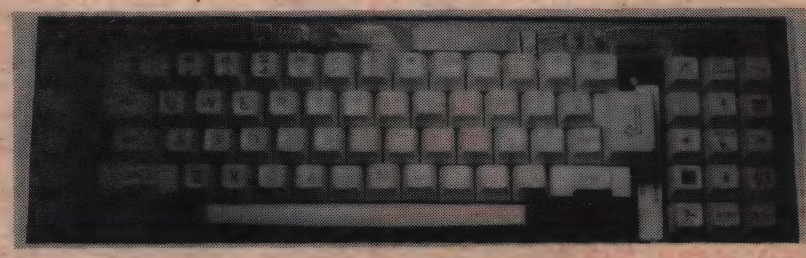
SPECS: +5VDC — 4 AMPS MAX
+12VDC — 0.8 AMPS MAX
−5VDC — 0.8 AMPS MAX
−12VDC — 0.8 AMPS MAX
INPUT 110/220 VAC 50/60 Hz
75 WATTS MAX INPUT UL#E81169

BRAND NEW UNUSED!

$18.95 EACH — 3 FOR $45.00
3 WIRE AC CORD — $2.00
ORDER NOW — ONLY 800 LEFT
WE HAD 2,800 AT THE BEGINNING

ASCII KEYBOARD

* 8048
* 5V only



* NEW
* Serial
* Parallel
* $19.95

A great deal, this brand new ASCII keyboard came from AES DATA, one of the largest makers of word processors in the world. A novel circuit generates both serial and parallel ASCII out allowing use on both APPLE® and IBM® styles of system. The unit runs on +5V only, has Hall effect keyswitches and uses an 8048 micro for operation. The sculptured keytops are arranged in typewriter style for quick learning and are an attractive light beige in color. We got them for 5% of the $169.00 that AES paid and so we can sell them dirt cheap and still make money. Completely new with 20 pin ribbon IDC connector and pinout for easy interfacing $19.95

IC'S

LS00	$.25
LS02	$.25
LS04	$.25
LS08	$.28
LS09	$.29
LS10	$.25
LS11	$.35
LS14	$.59
LS20	$.25
LS21	$.29
LS27	$.49
LS30	$.25
LS32	$.45
LS38	$.35
LS51	$.30
LS74	$.35
LS85	$.69
LS86	$.39
LS93	$.55
LS109	$.39
LS112	$.39
LS123	$.79
LS125	$.49
LS126	$.49
LS138	$.55
LS139	$.55
LS153	$.55
LS155	$.69
LS158	$.59
LS161	$.65
LS163	$.65
LS164	$.69
LS166	$1.95
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LS175	$.55
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LS240	$.95
LS243	$.99
LS244	$1.29
LS245	$1.49
LS273	$1.49
LS280	$1.98
LS322	$5.95
LS323	$3.50
LS373	$1.39
LS374	$1.39
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LS670	$1.49
S00	$.35
S02	$.40
S04	$.35
S08	$.40
S32	$.40
S51	$.40
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S151	$.95
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3.000 MHZ	$1.49
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3.579 MHZ	$1.00
4.000 MHZ	$1.95
4.032 MHZ	$2.49
4.433 MHZ	$1.49
4.9152 MHZ	$2.49
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5.068 MHZ	$2.49
5.185 MHZ	$2.95
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6.000 MHZ	$2.49
6.144 MHZ	$2.95
6.5530 MHZ	$2.95
8.000 MHZ	$1.49
9.5420 MHZ	$2.95
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10.7386 MHZ	$2.95
12.000 MHZ	$2.49
14.318 MHZ	$1.49
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22.1184 MHZ	$2.95
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OSCILLATORS

8.000 MHZ	$7.95
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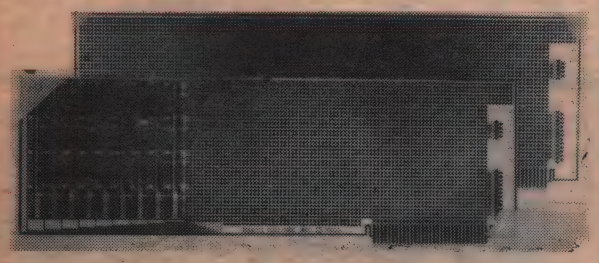
IBM®
BARE PC BOARDS



SIXPACK, A card that works just like the famous "SIXPACK," runs the same software. A great buy for the builder $29.95
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PROM set for above card (2) $24.95
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512K CARD, Fully locatable $19.95
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MEMORY PROTOTYPE, A full sized card with a 256K/1M byte for 64K/256K DRAMS using 1/3 of card. No drive circuitry, all CAS RAS etc to WW pins. +5, Gnd, 0.1 Caps all traced in. Has DB-9 and DB-25 footprint on end $24.95
PIA PROTOTYPE. A fully locatable dual port PIA card, has 1/4 of card for PIA, balance all WW holes $29.95
PIA CARD. A fully locatable 1/2 sized card with two fully locatable ports on 1/2 the card and WW holes on rest. Short sized for the short slot $19.95
EXTENDER CARD. A 6" extender for easy work and access .$19.95

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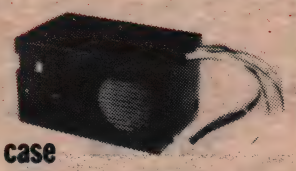
SWITCHING POWER SUPPLY



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Two new power supplies to power your IBM® work-a-like the 100 Watt one will run most systems, the 130 Watt one is ideal for hard disc systems. Both have the IBM® standard power connector and 2 drive power plugs so they drop right into the case and plug into the drives and mother board right away.

100 WATT	130 WATT
+5V. @ 10 AMPS	+5V. @ 15 AMPS
+12V. @ 3.5 AMPS	+12V. @ 4.5 AMPS
+5V. @ 0.5 AMPS	+5V. @ 0.5 AMPS
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$99.00	**$129.00**

IBM® CASES

WE HAVE THE BEST SELECTION OF CASES, BAR NONE

(A) Hinged lid with push button access, comes with plastic front bezel, 8 slot 0.8" (MBE-XT, XT) back panel cut for side switch or back switch power supply (specify) $79.95
(B) MEGABOARD case, hinged lid with plastic front and 7 slot 0.8" back panel, cut for back switch power supply $89.95
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(D) Hinged lid case cut for 6502/IBM machines with front cutouts for keyboard etc $69.95
(E) ABS case for 6502 machines, fits our 6502 motherboard and looks just like Apple©. Has the numeric function keyboard cutout $49.95

EXTRA ASSEMBLY PARTS FOR SYSTEMS

(A) Space fillers, plastic, for std drive $4.00
(B) Space fillers, plastic for ½ ht. drive $2.50
(C) Metal plates for mounting PCB in case $1.50
(Please specify type needed)
(D) Standoffs, 1/4" $.5, 3/8" $.7, 1/2" $.10, 5/8" $.12, 3/4" $.15, 7/8" $.17, 1.0" $.20.

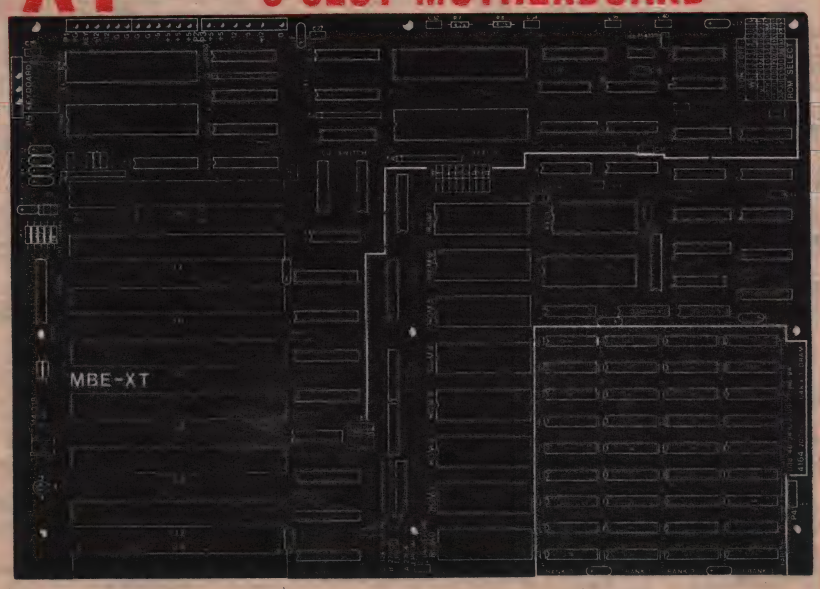
MBE-XT
AN IBM® XT COMPATIBLE 8 SLOT MOTHERBOARD

MBE-XT BARE PCB WITH MANUAL AND SCHEMATICS.
$49.95

LAZY BOARD

What is your time worth?? We have had a bunch of MBE-XT boards stuffed and wave soldered so you can save all that time soldering them up. All you need are the IC's memory, and BIOS and you are set to go $159.00

FULLY WIRED AND TESTED WITH 64K ON BOARD WITH MEGABIOS AND MANUAL
$395.00



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- 8087 MATH PROCESSOR, OPTIONAL
- UP TO 256K DRAM ON BOARD
- HAS DIGITAL DELAY LINE FOR ERROR FREE MEMORY REFRESH
- 8 IBM COMPATIBLE EXPANSION SLOTS
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- IBM POWER PLUG COMPATIBLE
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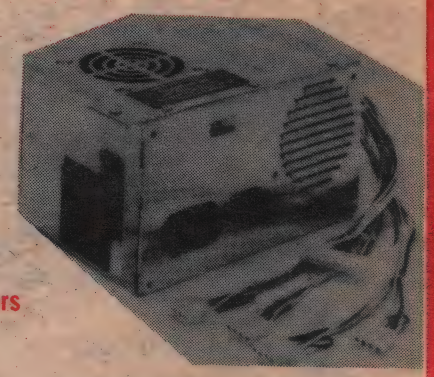

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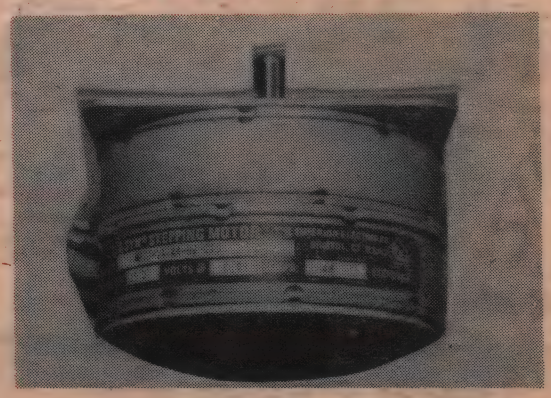

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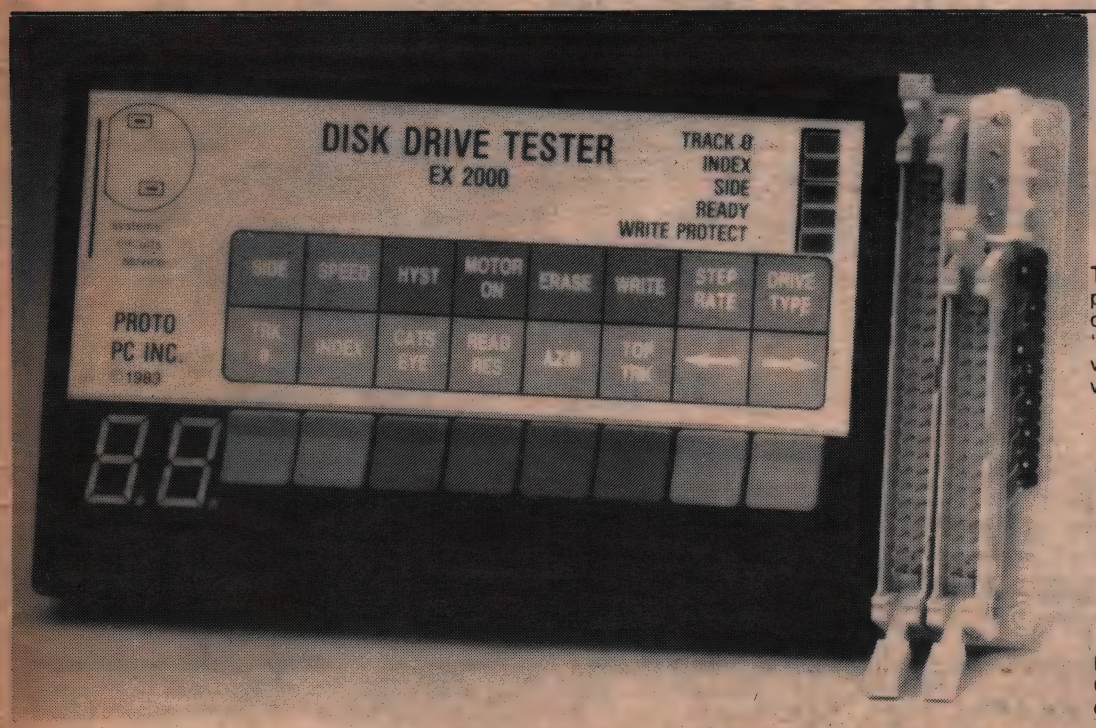

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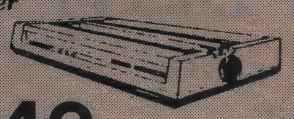

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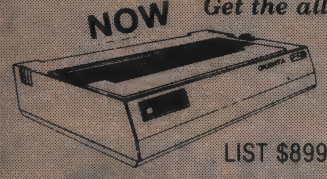

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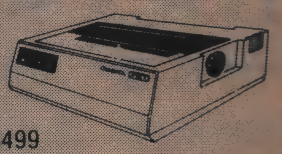

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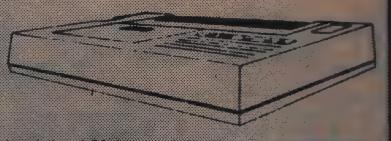

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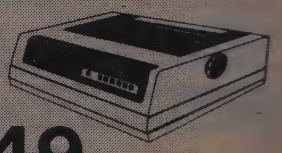

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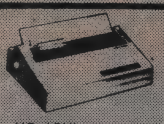

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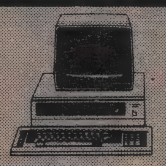

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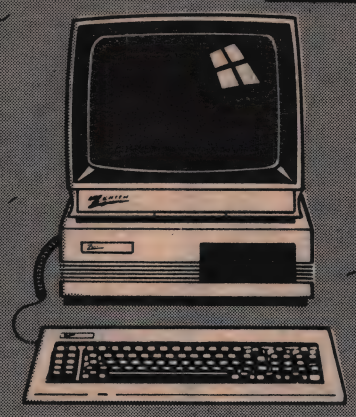

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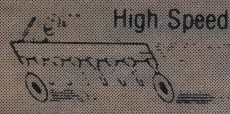

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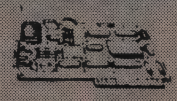

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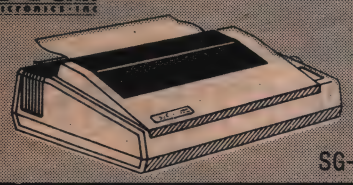

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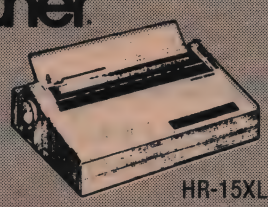

HR-15XL

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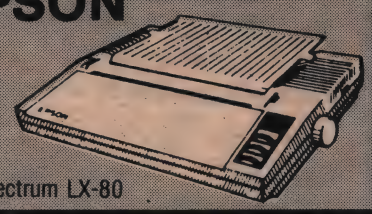

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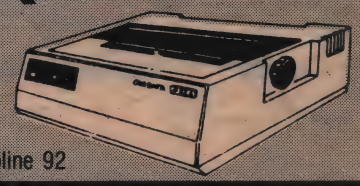

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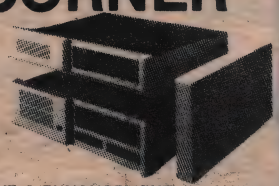

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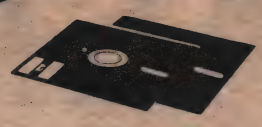

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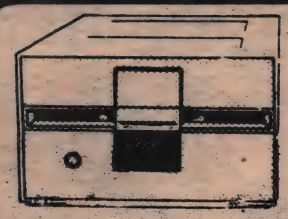

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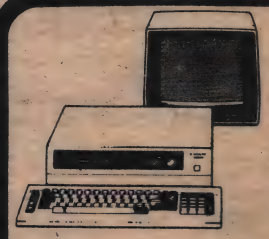

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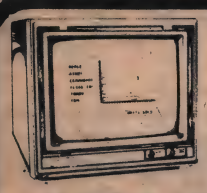

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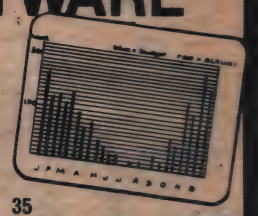

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1 MEG. quad disc drives, plus cases and power supplies for same. Listed below are the system components we offer.

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Here we go with another blockbuster buy on disc drives which should make the competion's head spin! We are offering brand new, Mitsubishi no. 4853, 1/2 height, 1 megabyte, mini floppy disc drives. These drives are beautiful. They are fully Shugart 34 pin compatible. All are double side, double density, 80 tracks per side units. Each runs on +5vdc, .5A and +12vdc, .7A. Just the drives to use with your IBM, Sanyo or other computer. Each order will come with schematics and pin out data.

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* RADIO SHACK
* HEATH
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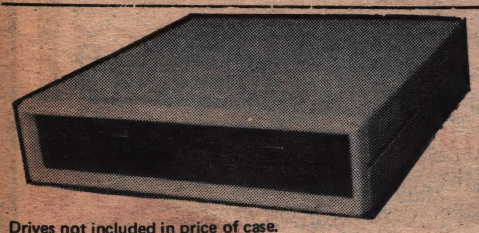
* SANYO

Shpg. Wt. 4 Lbs. SPL-85C-35 $175.00 2/$325.00 Qty. pricing available.

Need a cabinet? See Below!



Dual 1/2 Height Disc Drive Case

We have a small quantity of very well made, stylish, aluminum cabinets which will house the above 1/2 height Mitsubishi drives, or any other 1/2 height drives for that matter. They were originally intended to house a CPM based system, 2 disc drives and a Boschert power supply. The cabinets come with top, bottom, front bezel and rear panel. Internal measurements are 13-3/8" deep x 13-5/16" wide x 3-1/4" high. They will fit some of the single board computers which are currently on the market. Original cost on these cabinets was over $180.00 in large quantities.

Drives not included in price of case.

Want a power supply to fit this case? See Below!

Shpg. Wt. 8 Lbs. SPL-426A-35 $50.00 each

±5V and ±12V Boschert Switching Power Supply

This Boschert power supply, made by one of the most respected names in the business, was designed specifically to fit into the above case along with 2 of the above 1/2 height Mitsubishi disc drives and a single board computer. Input is 115/230 jumper selectable, with surge protection by 2 MOV's and a 3A fuse! Outputs are +5V @ 5A, +12V @ 2A, −12V @ .5A, and −5V @ .5A. They are very well designed, light weight and compact. Each one new, unused. Most are in the original factory cartons, guarenteed OK and up to snuff. List on this power supply is over $100.00.

Shpg. Wt. 2 Lbs. PS-7 $40.00

SPECIAL DEAL on the above components:

The drives, case and power supply above are available separately or can be purchased as a package. Buy 2 Mitsubishi 4853 disc drives, 1 dual drive cabinet and 1 Boschert power supply and save $15.00 off the already low price of $415.00. Others are charging over $650.00 for units that are similar in storage capacity, but not near the quality of our unit. We have seen these bare drives alone upwards of $269.00 each in other publications. You get 2 megabytes of highly reliable storage for only $400.00. The supply of these parts is limited, so order early. To order, ask for special disc drive deal on page 1 of the catalog.

Shpg Wt 14 Lbs. "Special Deal" $400.00

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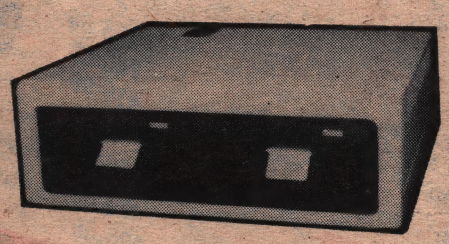

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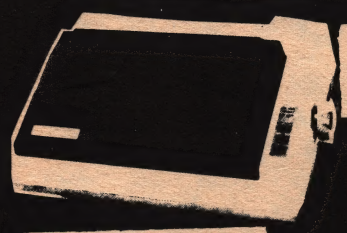

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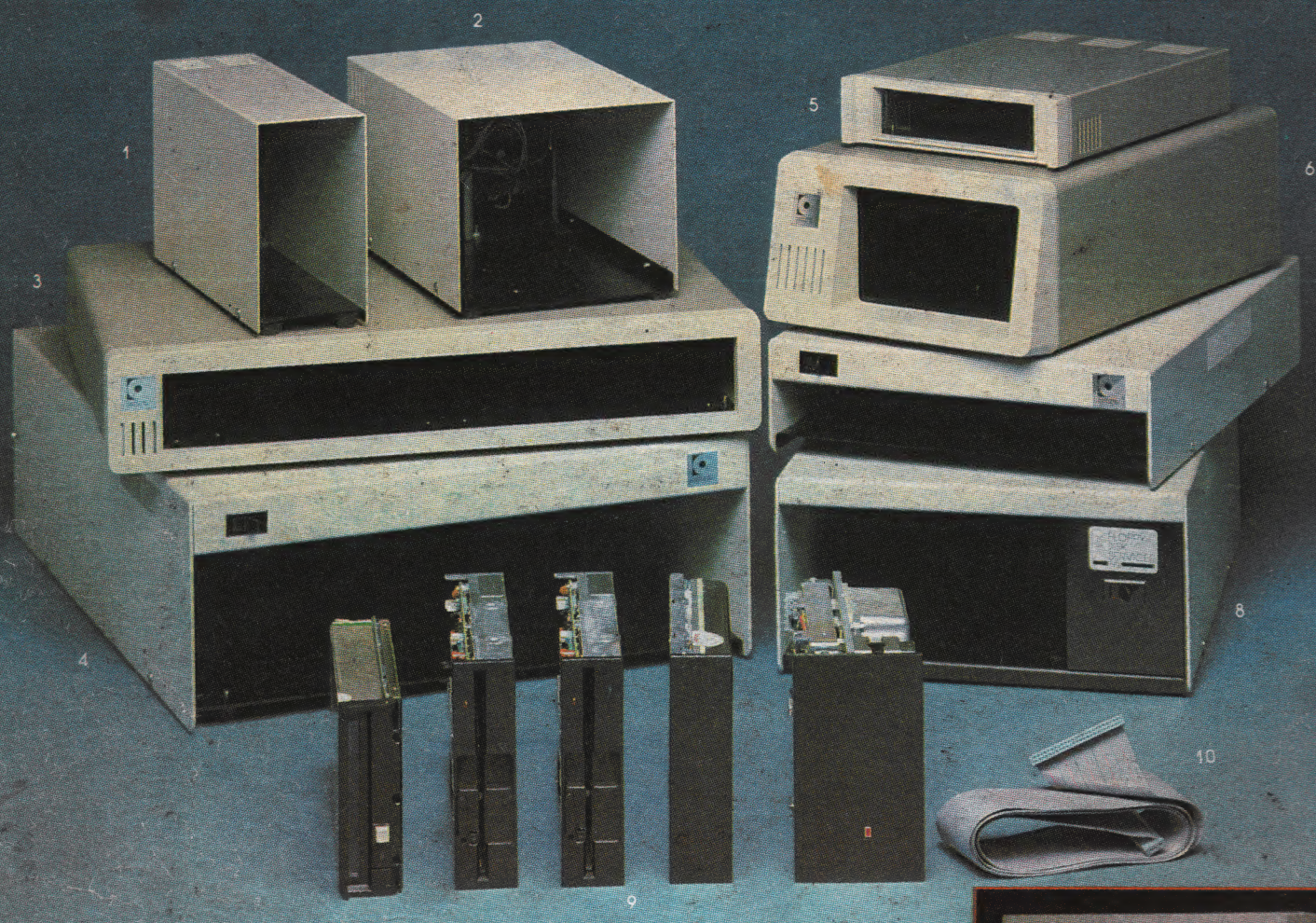

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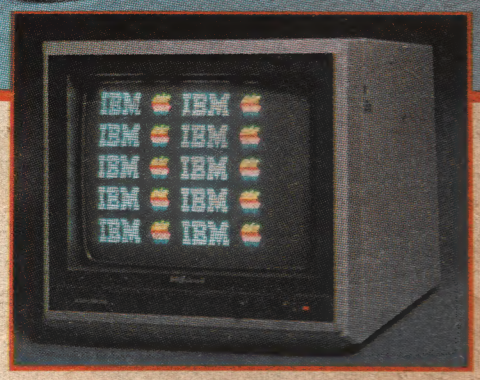

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